FOUNDRY TRADE JOURNAL

EST. 1902

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Offices: John Adam House, John Adam St., London, W.C.2

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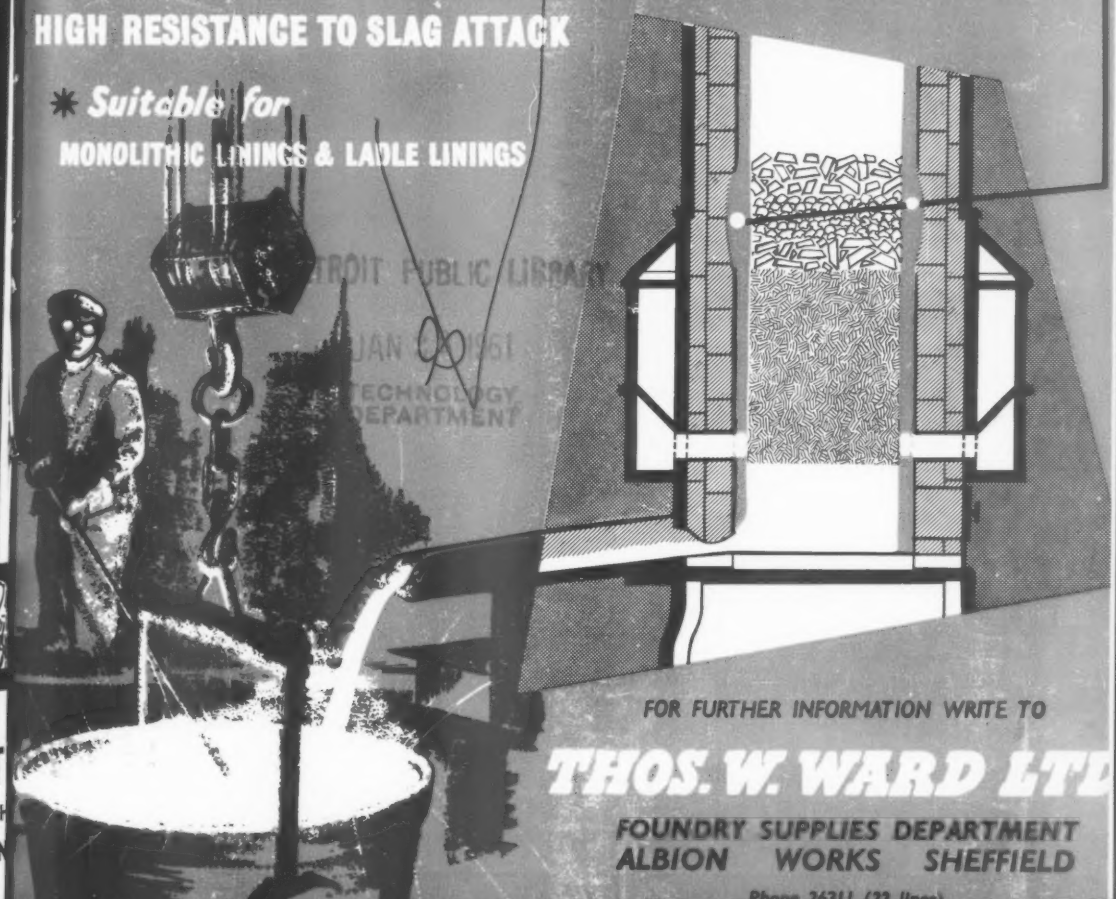

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The *prepared* foundation for a casting job—large or small—is the vital contribution to the highest degree of accuracy. Spermolin Core Oils and Binders minimise fluctuations in processing and effect economy in production costs—*and*—no waste castings. Spermolin gets to the core of technical efficiency!

Adjacent we illustrate mould and cores for the 60-ton planing machine shown below—a fine example of the results of using the highest quality core oils and creams famed as Spermolin.

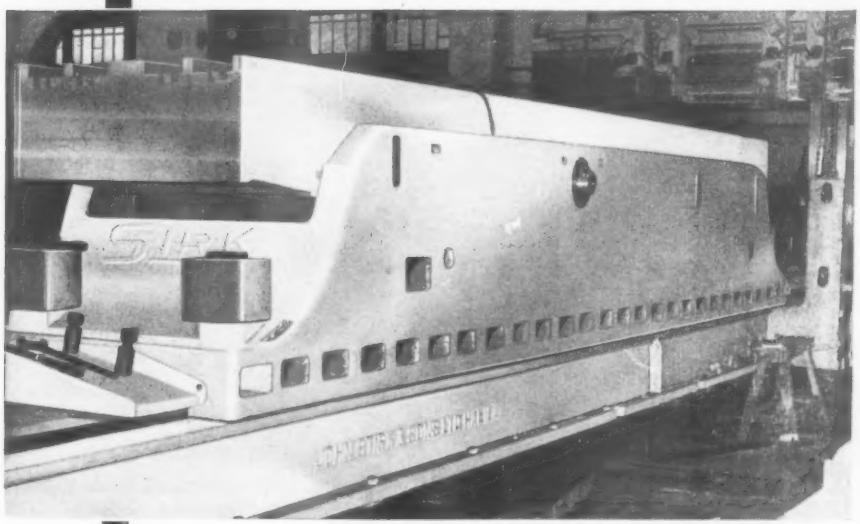

Photo by courtesy of Messrs. John Stirk & Sons Ltd., Halifax

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the secret of good casting

Established over half a century.

2 UNION STREET SOUTH · HALIFAX

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FASTEST . . .
in its class, this machine out-produces any other moulding machine in the world!

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a completely independent oil pump unit ensures powerful, positive and precise operation.

SAFEST . . .
because all operations are remotely controlled.

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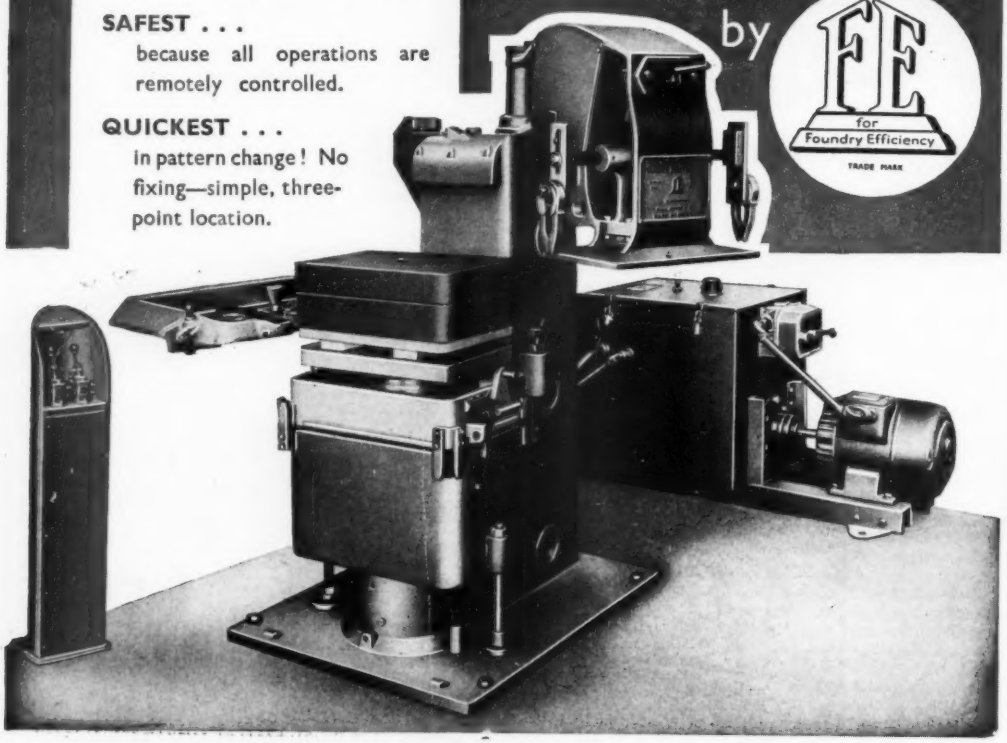
by FE for Foundry Efficiency TRADE MARK



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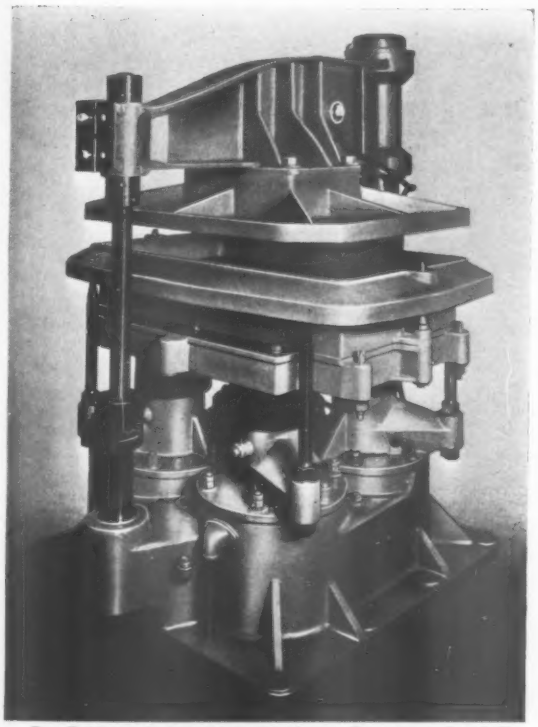

D.SS7 Magnetic Moulding Machine. (Box size 46" × 23")

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Christmas 1960

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The most efficient wet type Spark Arresters are without doubt

Roper

Because Roper productions are more than efficient they are reliable in operation

Illustration on left, a Wet type Spark Arrester with Inspection Platform serving a 17 ton per hour Cupola.

At right is shown Spark and Dust Suppressor with a Spray Jet giving a double water curtain.

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Photographs by courtesy of BILSTON FOUNDRIES LTD.

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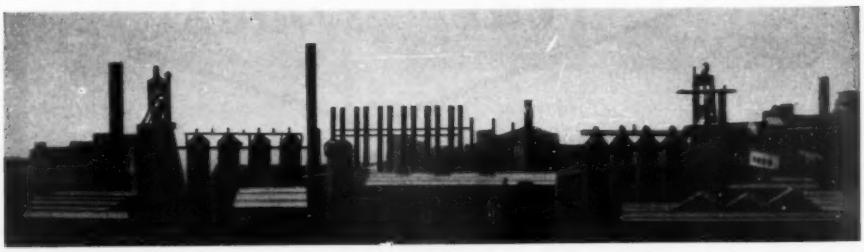
Question which type of dust collection and control plant?



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We have specialised in the design, manufacture and installation of dust collection and control plant for a good many years and today our range is second to none. Plant manufactured by our Gas Cleaning Division includes: Holmes-Elex Electrical Precipitators: Holmes Retroflux and Standard Bag Filters: the Holmes Schneible Multi-Wash System: Holmes-Rothemuhle Multi-Cell Cyclone Dust Collectors and Trion Electronic Air Filters. Enquiries normally entail visits to site by an engineer from our Test and Process Development Section to assess the particular problems involved and their solution in terms of the comprehensive range of plant which is available. Extensive laboratory facilities exist for the examination of dust and fumes, and, where necessary, arrangements can be made for pilot plant to be installed for trial purposes. Detailed technical brochures on all types of plant are available and can be had on request.

W. C. HOLMES & CO. LTD.

Gas Cleaning Division
Turnbridge, Huddersfield

Telephones: Huddersfield 5280
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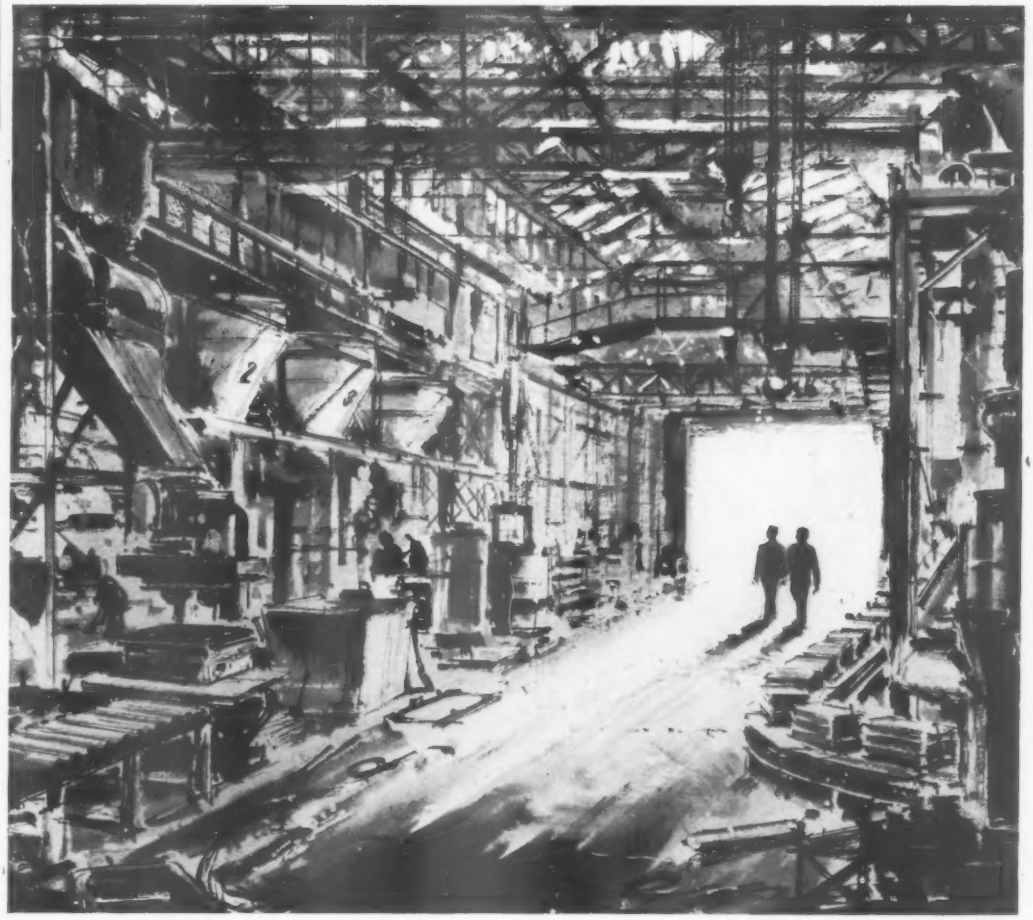

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The comprehensive Surfex range includes dressings for gravity dies, sand-mould and cores. For production of steel, iron and non-ferrous alloy castings.

Surfex AL4 White Core paint being sprayed on a cylinder head jacket core.

FULL INFORMATION IN OUR NEW LEAFLET NO. 9.

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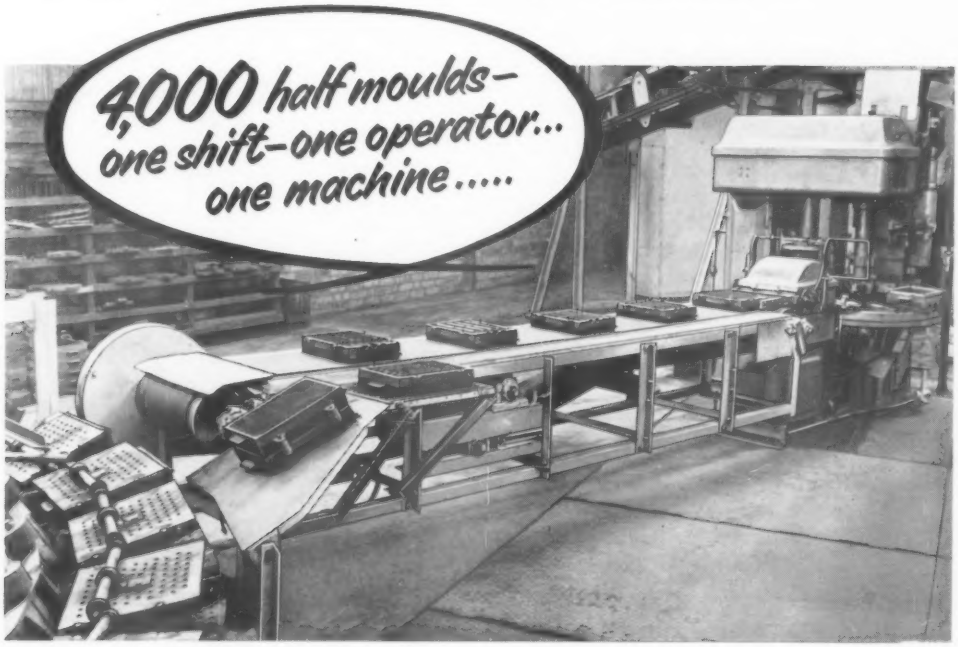
Manufactured by

HARBOROUGH CONSTRUCTION CO·LTD·MARKET HARBOROUGH

Heeley & Peart celebrate 50th anniversary with outstanding achievement!



Originally founded in Birmingham over years 100 ago, Heeley & Peart, with their progressive outlook, acknowledge the importance of equipping their foundry with the most efficient and up-to-date plant available. The installation of the Hallsworth Automatic Moulding System has achieved a remarkable increase in their production of small castings, so much so that they are in the process of integrating a second installation with the first. This expansion will have the additional effect of increasing their present production from 2,000 to 4,000 complete moulds per shift, using only 30% more floor space.

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For more detailed information please write or phone for illustrated brochure.

We offer our congratulations to Heeley and Peart of Newport, Mon., in their 50th year of making fine malleable castings.

HALLSWORTH AUTOMATIC MOULDING SYSTEM

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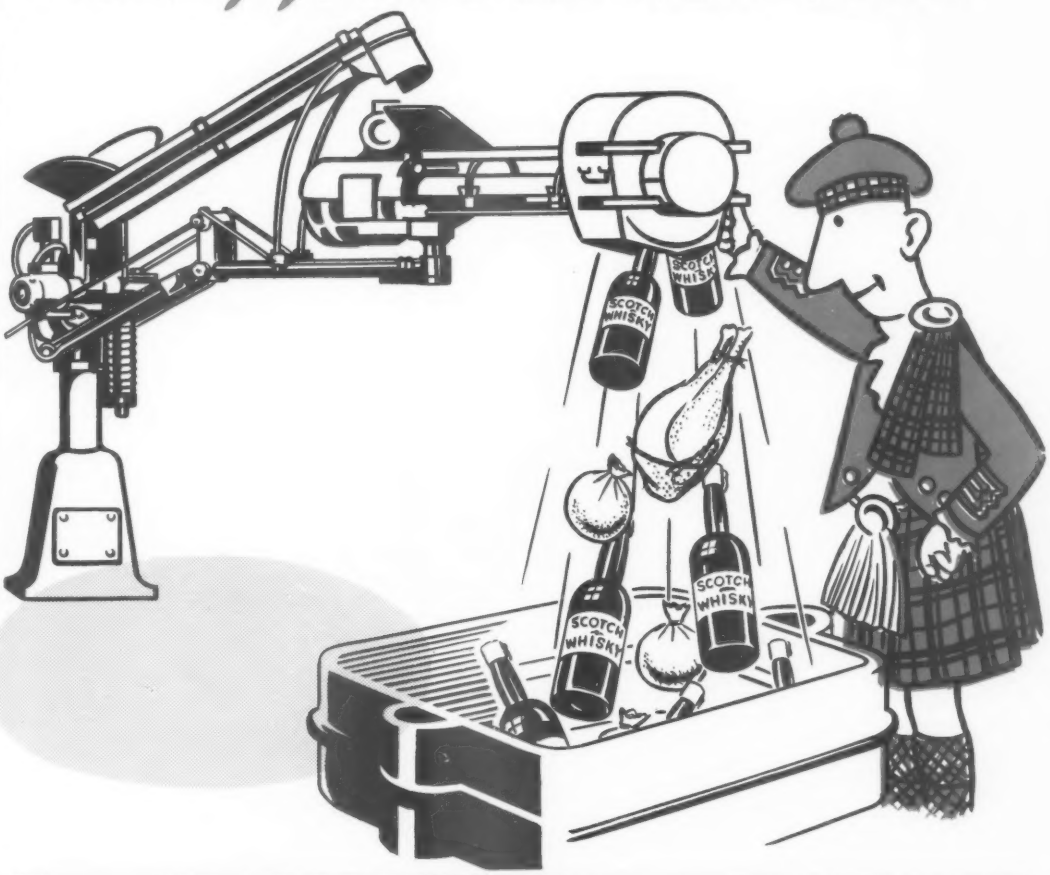

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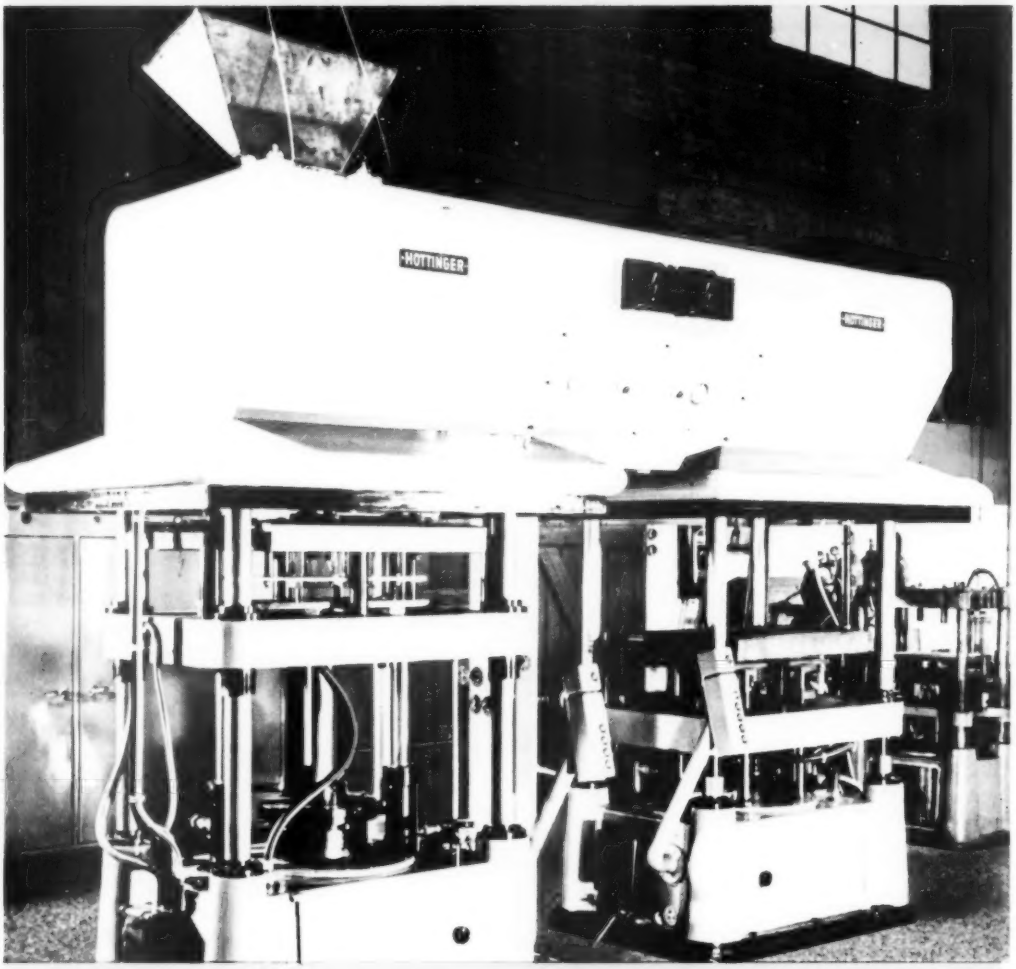

SHELL—and CORE SHOOTING MACHINE

1 Operator 36′ × 28″ Fully or Semi-automatic

As installed for the manufacture of Cores for Cylinder Blocks.
Maximum Core Dimensions 48″ × 32″

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HB/6, HB/8, HB/9 (Furane)

The Characteristics of these binders represent a major advance in core making technique . . . .

- **Cores cure in the heated box in *5* to *15 seconds***
- **Conventional blowers can be employed**
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- **Superlative knockout characteristics**

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R28.

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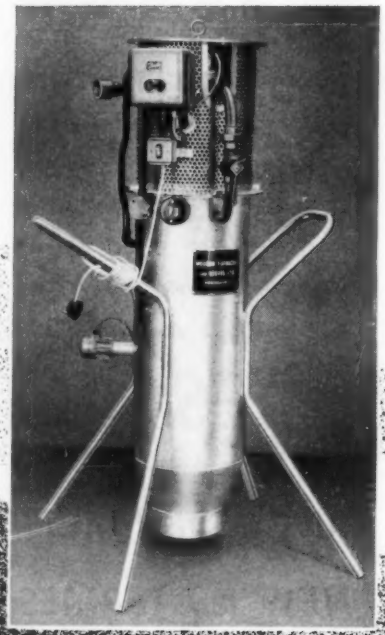
An important Drying Unit



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Developed by the North Western Gas Board under whose licence we are manufacturing it, this new Hot Air Unit is of unique design, robust construction and light weight. A cylindrical body encloses combustion chamber and ignition controls. An axial fan provides air for heating and delivery; this fan also keeps the cylinder cool when in use. The unit is self-supporting, standing on legs which are integral with the body. Push button control is included with high voltage ignition and an electronic device operates a solenoid valve in the gas supply to provide protection against electrical and gas failure.

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Thermal Output: 400,000 B.T.U.s per hour
Hot Air Discharge: 400 cubic feet per minute at N.T.P.

Temperature Range up to 400°C.
Weight of Unit 140 lb.

Send for fuller details. As Industrial Furnace Builders we can also supply other equipment for chemical processing including Portable Hot Air Dryer unit and Gas Burner.

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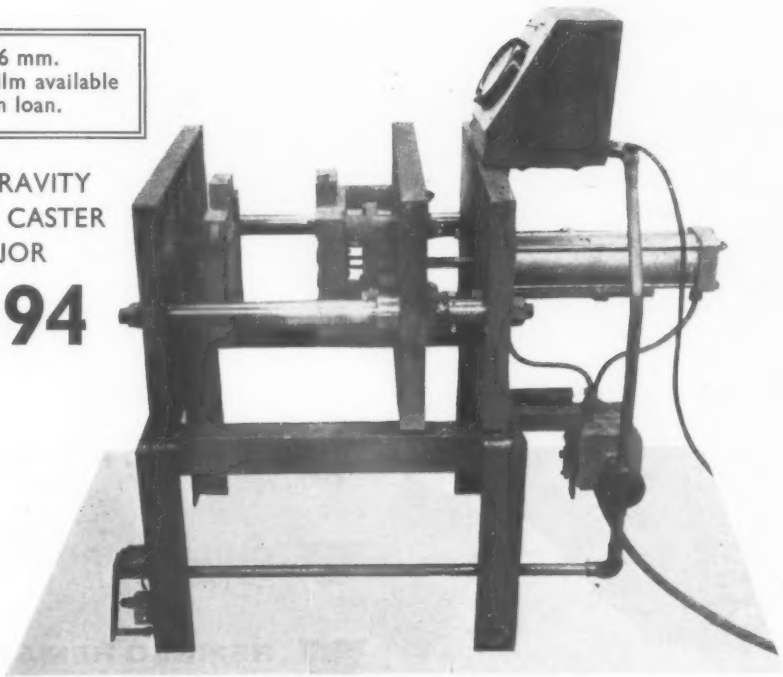

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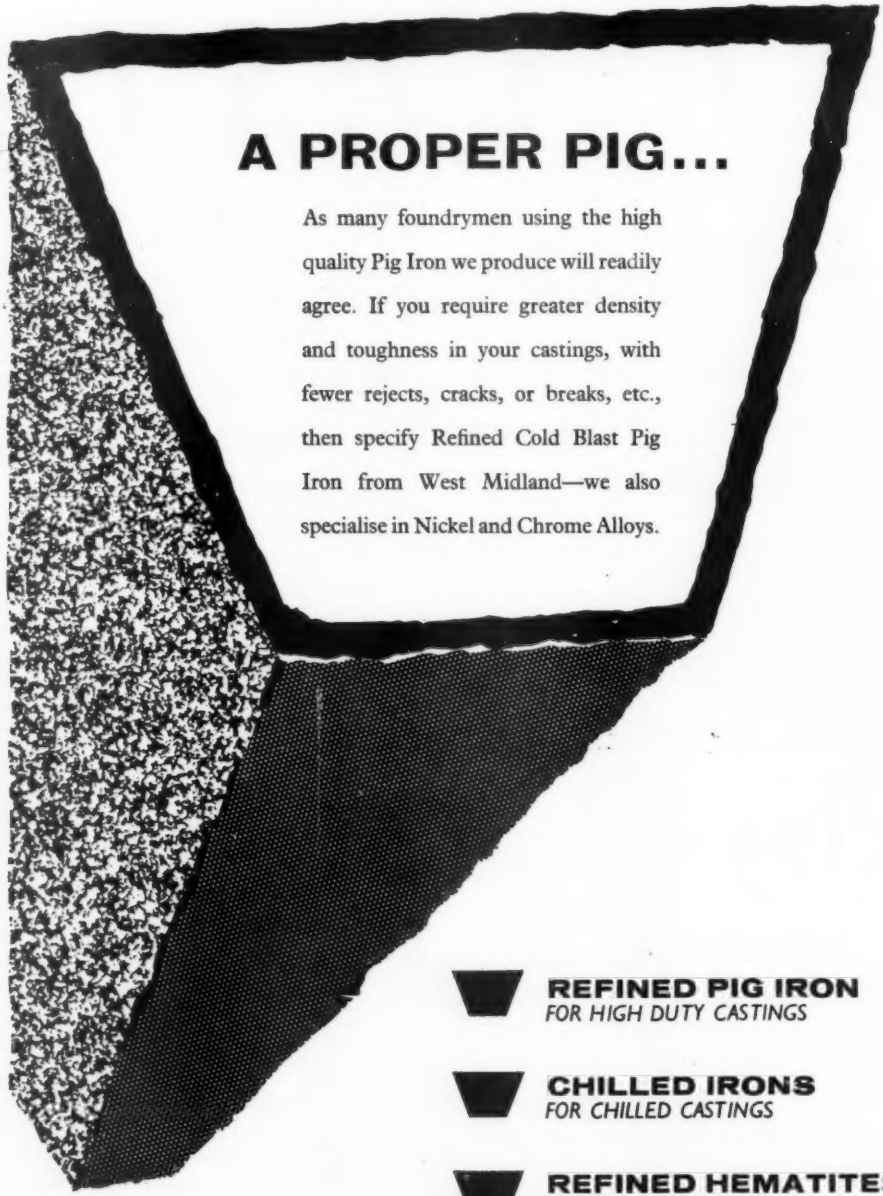

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FOR HIGH DUTY CASTINGS

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The fastest method of cleaning castings!

AT
TILLING-STEVENS LTD.
MAIDSTONE

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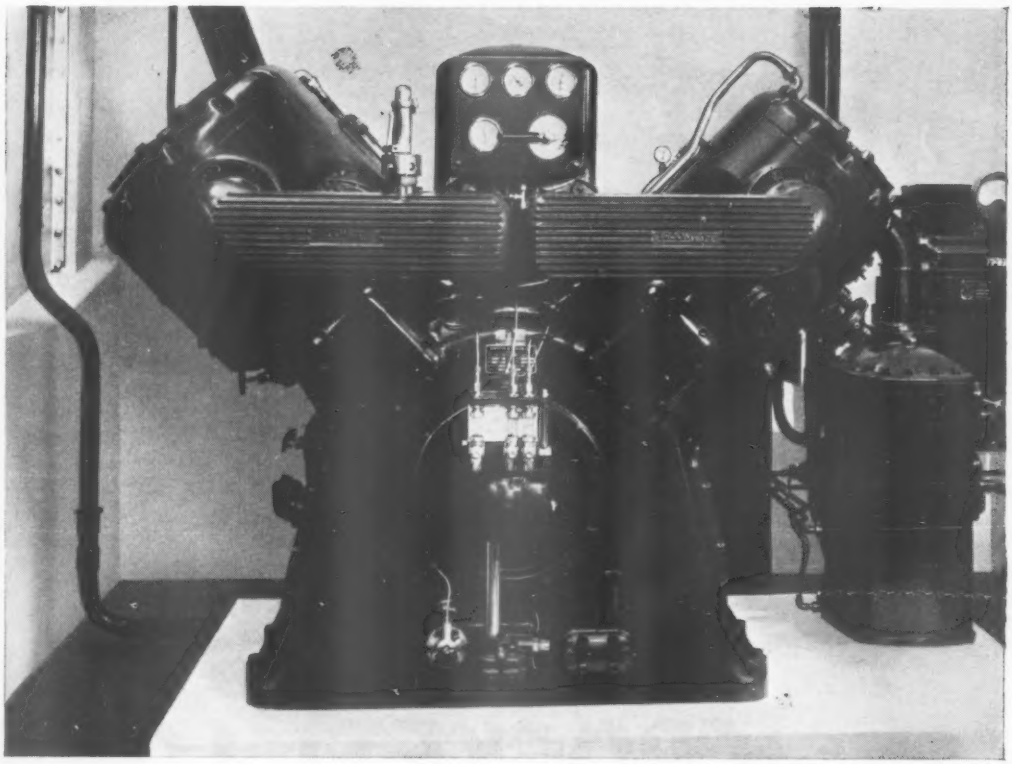

Type V500 delivering 525 c.f.m. of free air at 100 p.s.i.

What do you look for when you are choosing a stationary compressor? Low running costs? High efficiency? Minimum maintenance? Compact dimensions? Reliability?

. . . the NEW 'V' TYPE RANGE has them all!

Embodying the characteristics that have made "BROOMWADE" equipment world-famous, and incorporating many new features, the "V" Type Range represents the most advanced, reliable and economical compressors we have ever produced. Four models are available with outputs from 365 to 1000 c.f.m.

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782 SAS

UNBEATABLE!

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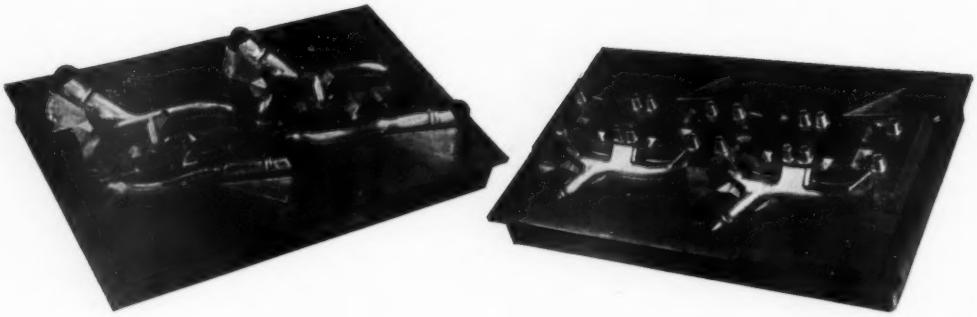

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SKLENAR

furnaces for general duties in the foundry.

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SKLENAR furnaces melt light alloys, brasses, bronzes, and grey iron in sequence with no risk of contamination.

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SKLENAR furnaces give quick melts (500 lb. brass in 35 minutes) with low metal losses (maximum under 2 per cent.). Finger-tip control of atmosphere for melting non-ferrous metals is standard.

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HEPBURN CONVEYOR Co. Ltd.

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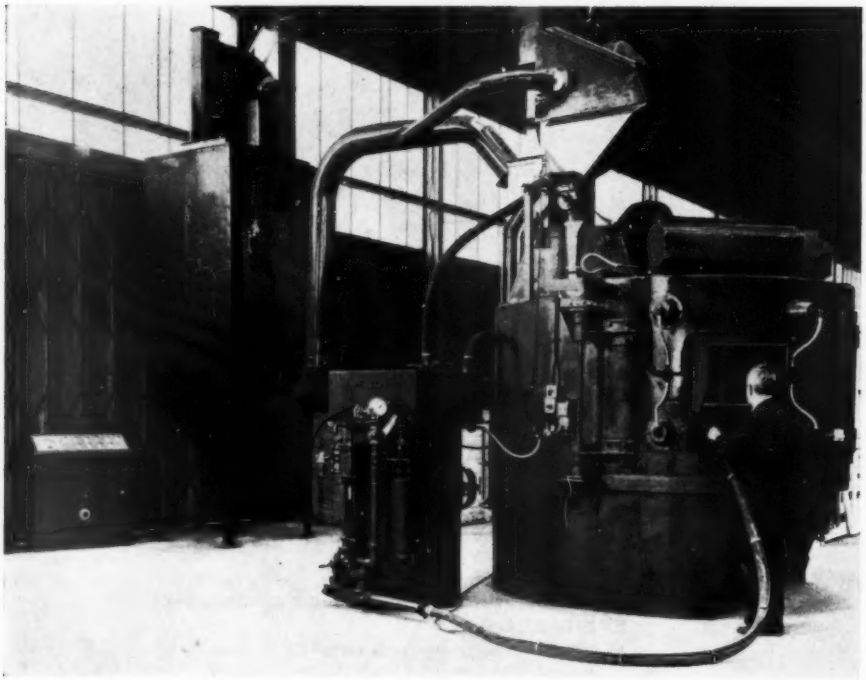

6' 0" dia. 'LK' Table Shot Blast Machine complete with Touch-up Unit together with Dust Collector.

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SHOT BLAST & DUST CONTROL EQUIPMENT

ALSO

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PNEUMATIC VIBRATOR

Available in two sizes :
1" bore 40/-
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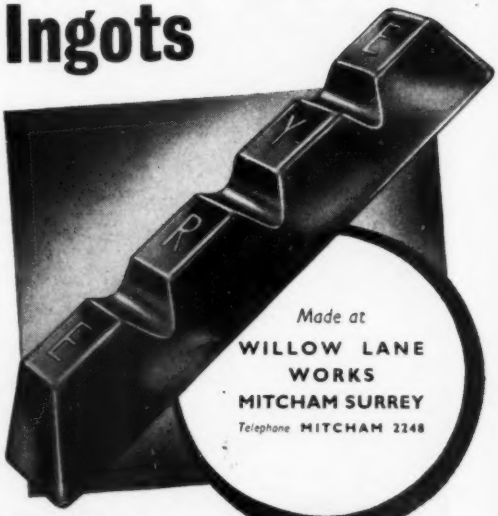

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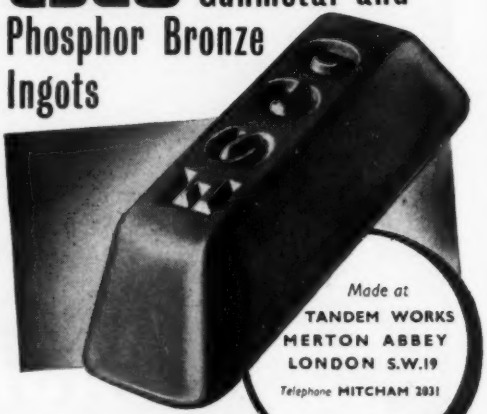

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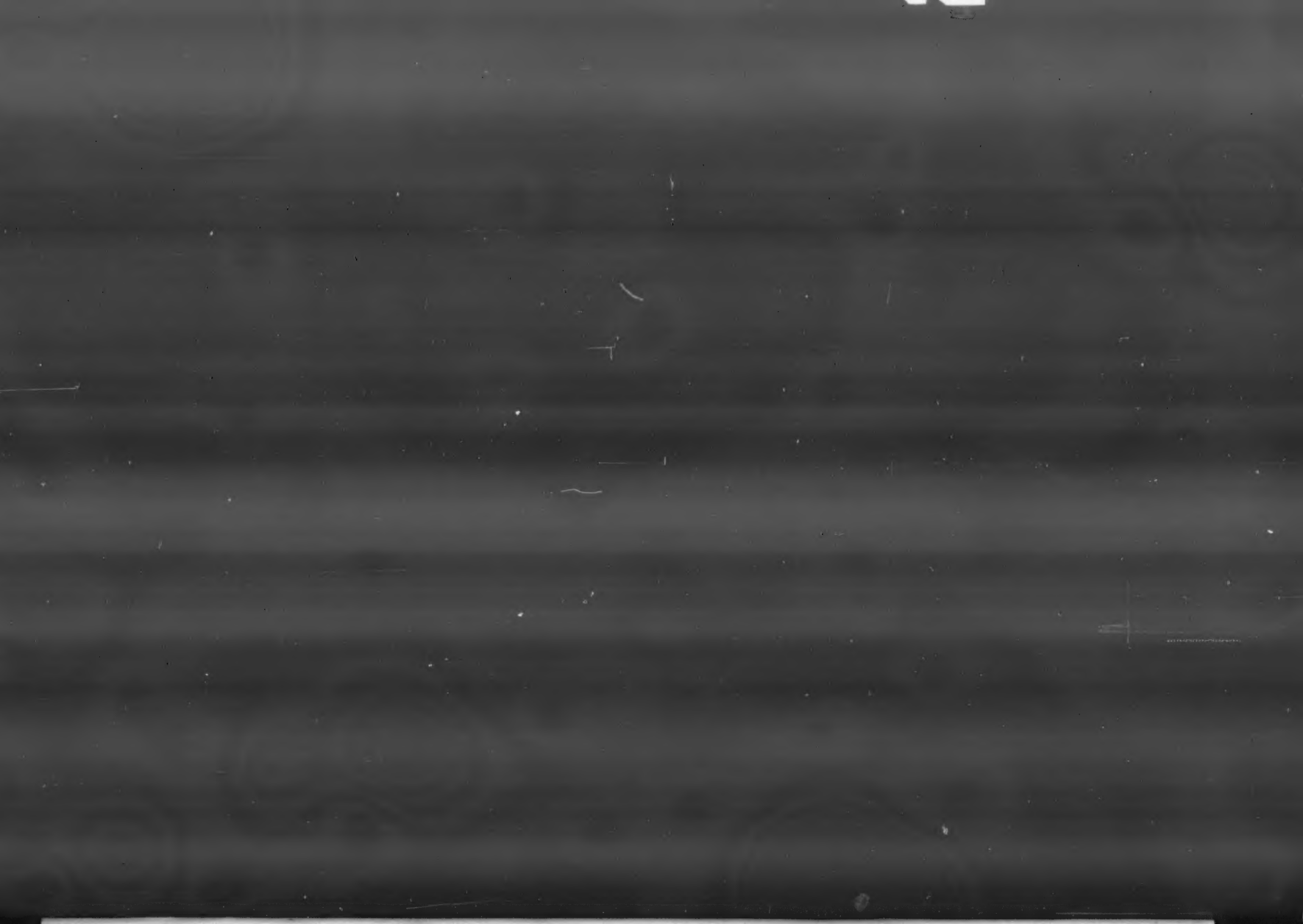

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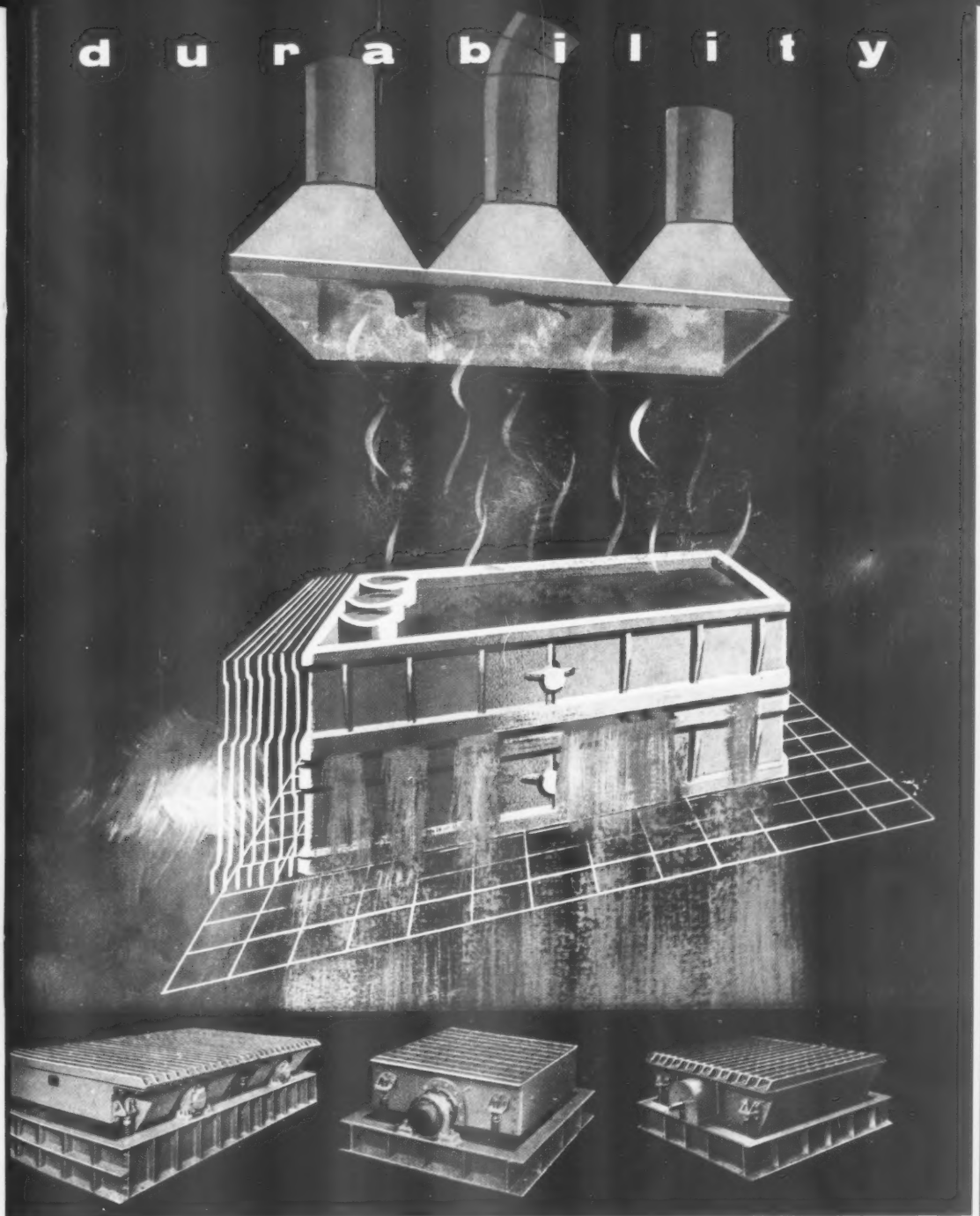

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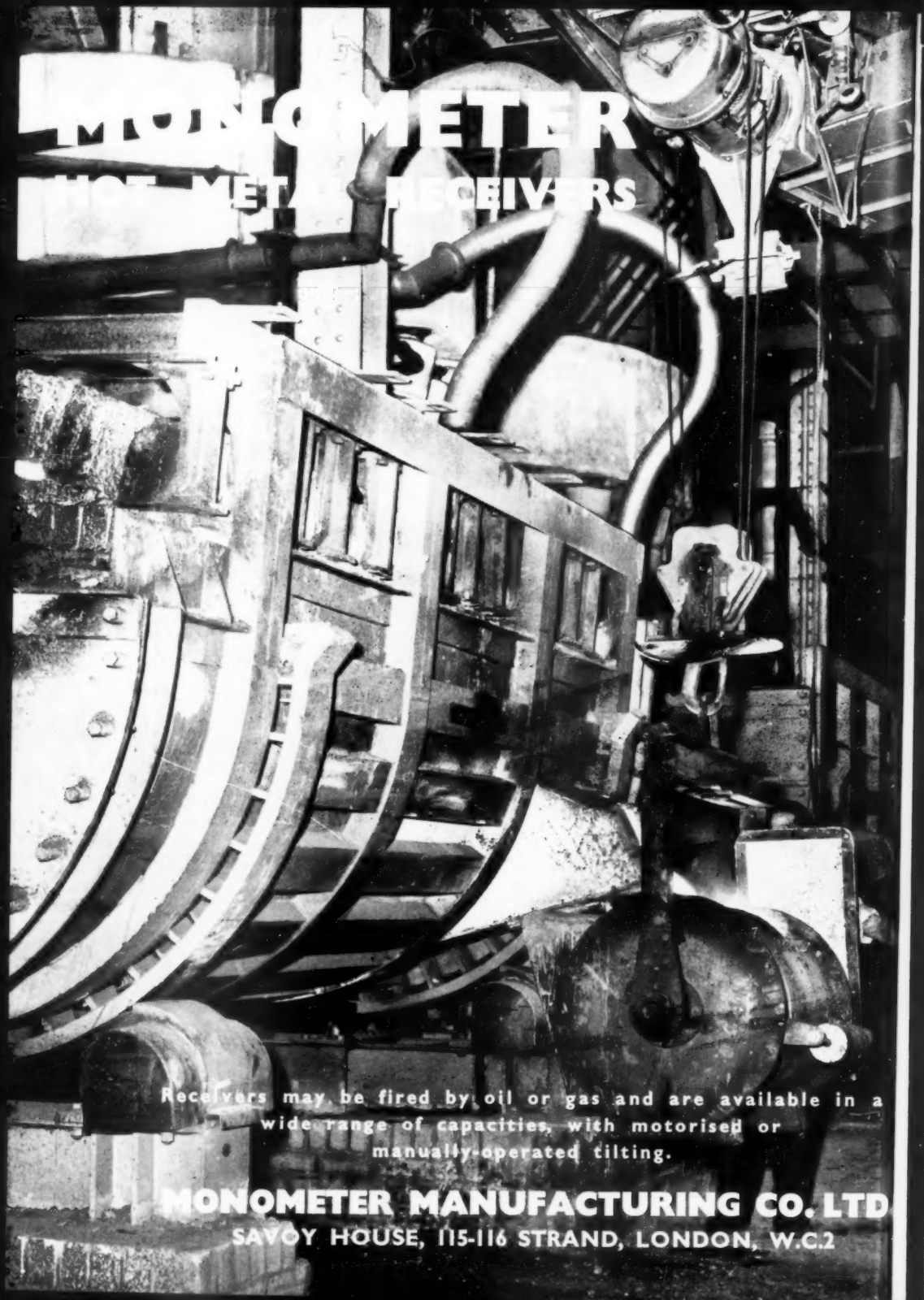
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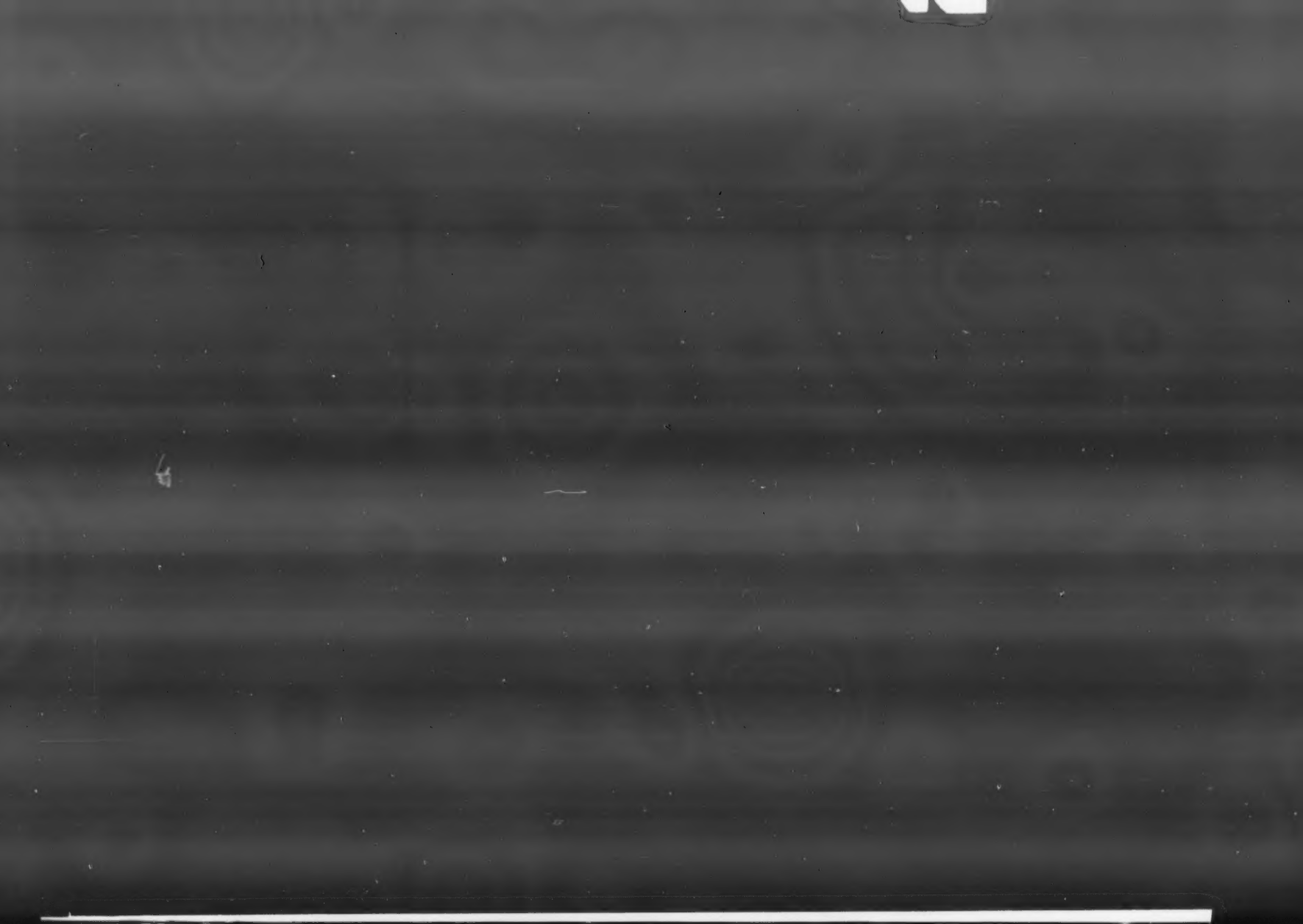

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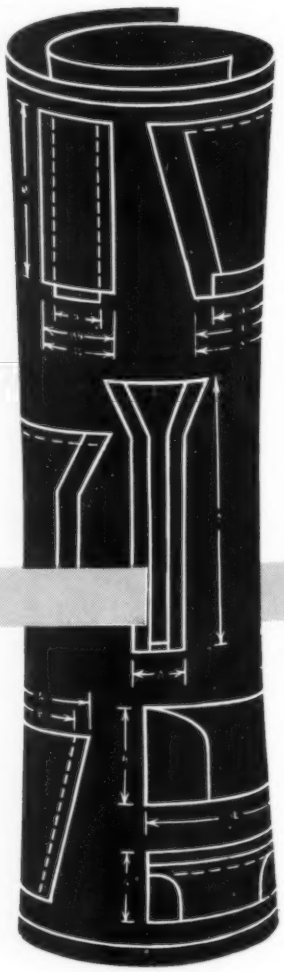

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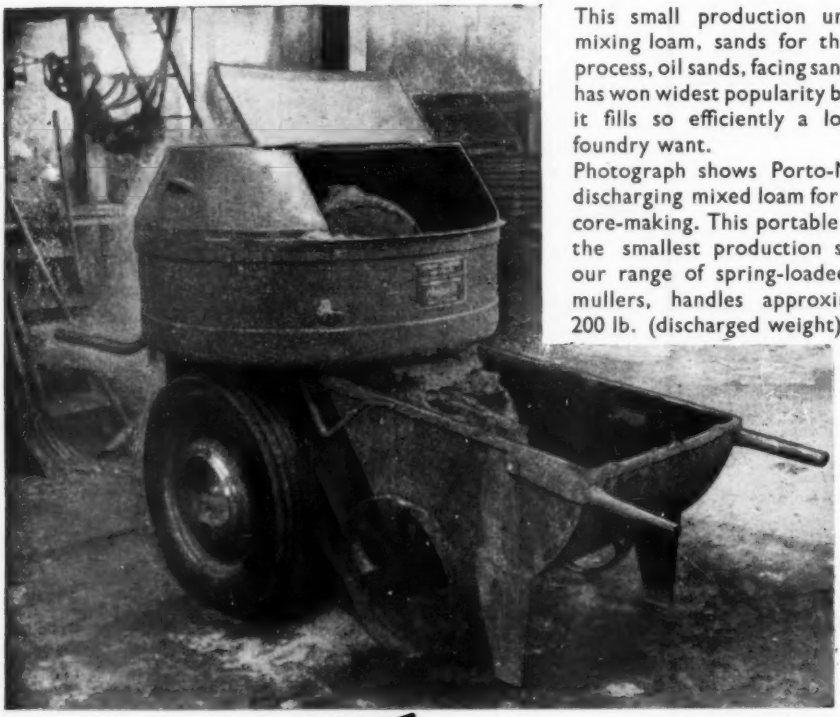

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FOUNDRY
TRADE JOURNAL

Vol. 109 December 22, 1960 No. 2298

Protection *versus* Free Trade

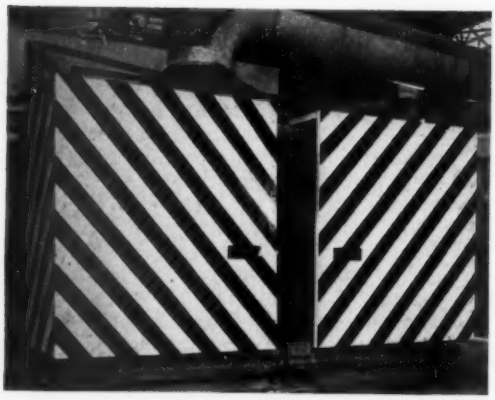
The (American) Gray Iron Founders' Society at their annual meeting received from Mr. O. R. Strackbein, an industrial politician, figures which give food for thought alike by Americans and their overseas suppliers, as the country's imports are constantly expanding. Mr. Strackbein instanced, *inter alia*, the case of bicycles where a " tariff " increase which had been imposed in US only caused American bicycle-makers to import components, whilst in the case of watches the lecturer said tariff increases had proved useless—that only a quota system would be effective in reducing imports. Typewriter and office machinery—once traditional American exports—had changed into imports, and so it was, too, with cameras. We are also well aware that the castings and other components for certain sections of the American industry are imported and in some cases from subsidiaries of American firms operating in Europe. American financial aid to the rest of the world has resulted in the provision of modern machinery in various factories overseas, and these —using labour which is relatively much cheaper than in America, because the costs of living are proportionately lower—can compete favourably with American home-producers.

This phenomenon of competition from large imports is no new problem to Great Britain, as for many decades there raged an interminable fight between the free-traders and the protectionists. Some economists believe that where inflation exists in a country, exports from that country carry with them a national currency—invisible, yet real—with each order completed. In time this can become a factor in the international money-market.

An aspect for consideration by United Kingdom manufacturers is in the creation of overseas manufacturing facilities in relation to their export potentialities. If the country chosen represents a high-cost-of-living market, then sales will probably be narrowed down to the home market in that country. With similar inference, Sir Norman Kipping has suggested, for example, that, for Australia, five small factories situated in each of the states there, is preferable to one located in any particular area. We see no solution to the American problem. Imposition of import quotas may increase internal costs and lead to " feather-bedding " which would make exporting still more difficult—but such arguments are merely reiterating those of the free-traders of this country! The statement that in the last resort a country which can feed its population from its own resources need never starve them through lack of exports is worth repetition in this context, especially because the United Kingdom is not in that happy position.

Parker Foundry Amenities

Last Monday, the Mayor of Derby accompanied by the Mayoress, opened a new canteen at the works of Parker Foundry (1929), Limited—a subsidiary of F. H. Lloyd & Company, Limited. The canteen is housed in a new £40,000 building which includes a modern showerbath and ablution block. These new amenities have been deemed essential by the management as the number of employees has been growing over the last few years and totals now about 450. The ceremony was presided over by Mr. F. N. Lloyd, chairman of the parent company. As a souvenir of the occasion, the Mayor was presented with a Crown Derby coffee-service and the Mayoress was the recipient of a bouquet. At a luncheon which followed, Mr. F. Brooks, the local organizer of the Amalgamated Union of Foundry Workers, expressed the appreciation of the workpeople of the new and better facilities placed at their disposal.



National Die-casting Congress

At the first National Die-casting Exposition and Congress held in Detroit, USA, last month, no fewer than 31 technical contributions were presented. Speaking at the session dealing with "What's Ahead in Die-castings," along with Mr. A. Triulzi (president of A. Triulzi, S.A.S., Milan), Mr. A. F. Bauer, chief engineer and assistant general manager of Doehler Jarvis Division of National Lead Company of Toledo, emphasized that European engineers had made extensive use of lightweight aluminium and magnesium parts in rear-engined cars mainly for weight balance, but were still using the cast-iron engine block for their front-engined cars. American engineers, who were using aluminium engines in front-engined cars, were employing this metal to increase car performance by reducing weight. In this connection, he cited the new Rambler die-cast aluminium cylinder-block, which his company were producing for American Motors, and other aluminium engines now in Buick, Oldsmobile and Pontiac, General Motors' models and Chrysler. In his paper, Mr. Bauer revealed that the Rambler cylinder-block was the first water-cooled die-cast six-cylinder engine block to be produced in the world. His company, he said, had produced 50,000 blocks for the Rambler car and Mr. Bauer predicted a great future for the die-cast block. He explained that the ultimate had not been reached in die-cast blocks, as there was now in development an engine with both cylinder-block and -head of aluminium, the wall thicknesses and shapes of which had been designed to provide maximum economy of aluminium combined with maximum strength. The blocks made by his firm, he said, were made on 2,000-ton pressure-die-casting machines, each having dies weighing 25 tons.

In Mr. Triulzi's paper, it was revealed that his company would soon deliver a 2,500-ton pressure-die-casting machine for producing the first die-cast four-cylinder block in Russia. The firm, he added, was also working on a design for an eight-cylinder pressure-die-cast aluminium cylinder-block.

Enclosure o a Shakeout

The illustrations printed alongside show the hydro-pneumatically-operated doors enclosing a shakeout exhaust hood—a feature of the Holmes - Schneible Multi - wash installation—in the steel foundry of English Steel Castings Corporation, Limited. These doors, which were designed in co-operation with English Steel Castings Corporation, Limited, are claimed to have been very successful in operation, and have resulted in a considerable saving of exhaust volume necessary at the shakeout postion. The installation is completed by two size 138 type "JC" collectors, a dewatering tank, hoods on the sand-preparation plant, fan and ducting. The upper photograph shows the "tiger-striped" doors in the closed position, and in the lower illustration they are open, after shaking out a box. This installation was inspected recently during visits to foundries in the Sheffield area made by member-parties of the Institute of British Foundrymen.

* See also page 787 of this issue.

American Automobile Developments and their Implications to Founders

By the Journal's American Correspondent

Knowing the interest among UK founders—and those in other countries, too—in automobile production *vis-à-vis* castings demand and sales, the following article was commissioned recently from the JOURNAL'S correspondent in America. Particularly it is valuable because it gives an impartial review of the position by a well-qualified observer who has the foundry industry's broad interests very much at heart. Several previous accounts of US trends in this sphere have been to some extent coloured according to which "axe" the writers had to "grind"—a feature completely absent from this summary.

Next year, 1961, may see in the USA more castings per car but a lower castings tonnage per car, as aluminium moves into automobile assemblies and replaces the heavier metal previously used. Most of the changes will occur in the new small compact cars which are entering the 1961 production schedules. At the beginning of July 1960, the US motor-industry slackened its rates of production to an almost alarmingly low level and lay-offs in the private-car as well as in truck-building shops accompanied this low state of activity. This also coincided with "changeover" time, changes of a less magnitude being introduced in most of the large and established cars at the same time as big differences were coming about through the introduction of the smaller, compact cars.

Statistical Position

The statistical position of the industry for 1960 demonstrates that the total output of 5,600,000 cars for 1959 has been exceeded by October 1, 1960, and approximately 1,250,000 more cars and trucks are being built during the balance of the year. Production of cars passed the 6,000,000 mark on November 22 and to this total should be added approximately 20 per cent. for truck units. The position of the American motor industry up to November 1960, compared with the same period in 1959 is as follows:—

	Jan. to Nov., 1960.	Jan. to Nov., 1959.
Total cars produced (US)	5,695,592	4,915,633
Total trucks produced (US)	1,039,542	1,010,422
Total cars and trucks (US)	6,735,134	5,926,055
Total cars and trucks (Canada)	332,400	328,260

Introduction of the Smaller Car

For years, American automobile manufacturers increased the power, size and weight of their cars to the 2-ton "monsters" that were producing both parking and payment problems. The "family" car, built with abundant space for comfort, was becoming out-of-date as more and more cars became used for individual and one-passenger transport. Hence, small cars, cut down in size and cost, with adequate power for existing needs, took their place. Since 1948, imports to the US have totalled 2,000,000 cars and, in 1959, 625,000 foreign-built cars were imported—an increase of 580,000 over the figure for 1955. On the other hand, exports of cars from the US dropped to 115,000, less than half the 1955 total.

US motor-car manufacturers promised reprisals if competition approached 10 per cent. of the market and with imports at an annual rate of 600,000, plus the rising increment of domestic manufacture, it meant that the time had come for them to act. In 1959, Volkswagen alone sold 120,000 vehicles in the US and in six months of 1960, the US had taken 77,000 units (see Table 1). (About 60 per cent. of the Volkswagen output is exported—over 400,000 units—and one third of this total reaches the US. Volkswagen is also reported to be increasing its Canadian facilities by 40 per cent.) There are strong indications that the success of the Volkswagen in the US prompted manufacturers to move in the direction of VW engineering. General Motors re-examined its research work on aluminium castings and, as a result, launched the Corvair, and the Ford Motor Company is reported as planning to manufacture a Ford model resembling the Volkswagen type.

The second half of 1960 showed that sales of imported cars were also "slipping" and despatches were down 20 per cent., while sales were off 12 per cent. for the January to August period, *viz.*:—

January to August:	1959.	1960.
US Registrations (Sales) of Cars	404,950	356,800
Shipments to US from abroad	446,000	360,000

This decline in US sales produced some disturbance among overseas manufacturers and pushed some of their production back on to their home markets. Meanwhile, the mid-year period of "changeover" in styles brought out the news that the number of smaller compact cars was to be increased by the production of several additional models. For example, Chevrolet is expanding its output to include a station wagon, a van-

American Automobile Developments

type sports wagon, a panel delivery and two pick-up-truck models. This marks the first time that any of these models have been built with rear-engine power by an American manufacturer.

Mr. E. N. Cole, general manager of the motor division of Chevrolet, expects 1961 passenger-car sales to reach as "high as seven millions," as compared to the 6,800,000 sales forecast for this year. He looks for a further drop in import sales in the US, possibly to around the 450,000 mark. He said that sales of trucks in 1961 should total 1,000,000 units, and that Chevrolet expects to sell 1,750,000 passengers cars this year (an increase from about 1,377,000 in 1959, when output was curtailed by the US steel strike), and to "top" this year's figure in 1961. Most of Chevrolet's expanded volume this year is coming from sales of its "Corvair," Mr. Cole said. Standard-sized passenger-car volume for the first seven months was up 1 per cent. from a year ago, he added, but including the "Corvair," the division's sales were up 15 per cent.

TABLE 1.—*Relative Position of Car Imports to US for the First Six Months of* 1960 *as Compared with* 1959.

	1960.	1959.
First	Volkswagen	Volkswagen
Second	Renault	Renault
Third	Opel	Brit. Ford
Fourth	Brit. Ford	Opel
Fifth	Fiat	Simca
Sixth	Triumph	Fiat
Seventh..	Austin Healey	Hillman (13th, 1960)
Eighth	Simca	Triumph
Ninth	M.G.	Vauxhall
Tenth	Peugeot	(16th in 1959)

The smaller compact cars are currently accounting for about 28 per cent. of the total US sales, and new, smaller, versions of the Buick, Oldsmobile and Pontiac are the culmination of several years' planning by General Motors Corporation. Buick's standard-size cars for 1961 are 1,600 lb. heavier than the compact "Special"; the new Buick "Special" is powered by a 155 b.h.p. aluminium-block V-8, 215 cu. in. engine, weighing only 318 lb. The compact six-passenger Oldsmobile F-85—a new and smaller entry in the low-price field—is also powered by an aluminium V-8 engine. The 215 cu. in. engine has one of the highest power-to-weight ratios in the industry; the basic engine weighs only 350 lb., or approximately half as much as the larger Oldsmobile engine.

Adoption of Aluminium

Aluminium "356" alloy is used for all major components of the F-85, including cylinder-block and -heads, intake manifold, clutch-housing and water-pump, said Mr. H. N. Metzel, chief engineer for Oldsmobile. Oldsmobile has redesigned its Hydramatic transmission for the F-85 and uses an aluminium-alloy case which is 95 lb. lighter than similar units used in the 1960 car. Iron castings are used in heavily-loaded areas, such as cylinder-bore liners, valve-guides, main-bearing caps and exhaust manifolds, and a special hardenable chrome/nickel alloy cast-iron is used to obtain long life for the camshaft. For lighter weight and optimum material distribution, the crankshaft is made of a pearlitic malleable cast iron, produced by a special, heat-treatment process.

The Pontiac V-8 engine remains the same, but modifications in design and construction make the 1961 version lighter in weight and more compact. Aluminium parts help to cut the weight of the power plant. The new aluminium block V-8 engines on some 1961 models were built as experimental engines as far back as 1952; for example, the aluminium V-8's in the Buick Special and Oldsmobile F-85 can trace some of their ancestry back to the 1953 experiments.

Estimated production of ten 1961 models up to October 29, 1960, showed the smaller compact cars running at 388,000 units or about 36.4 per cent. of the million car (1,068,400) output. Percentages of sales of total US compact cars show that in a 10-day period (October 10 to 20), Ford's models took 38.6 per cent. of the total:—

	Jan. to June, 1960.	Oct. 10 to 20, 1960.
Ford	37.2	38.6
General Motors'	14.0	20.0
Chrysler	12.4	13.7
American Motors' Corp.	28.9	23.0
Studebaker	7.5	4.9

Recent Sales of Smaller Cars

Recent sales of the smaller compact cars have shown Ford's new "Falcon" and American Motors' "Rambler" taking about 50 per cent. of the "compact market," whilst G.M., Chrysler and Studebaker-Packard split up the remainder, and low-priced, larger models usually occupying 58 per cent. of the total market, decreased their share of the market by 8 per cent. At current production rates, General Motors devoted 20.7 per cent. of its output to its four small cars—Chevrolet "Corvair," Buick "Special," Oldsmobile "F-85" and Pontiac "Tempest"; Chrysler Corporation devoted 32 per cent. to its Plymouth "Valiant" and Dodge "Lancer," and Ford's two small cars—"Falcon" and "Comet"—accounted for about 37 per cent. of its total production.

It is reported that Ford's is planning a small car of the Volkswagen size with a four-cylinder engine and called the "Cardinal." It is believed that the tooling up for the car would be carried out in Europe, with a good part of it being built in Germany. US labour has been protesting at these reported plans, claiming that the car should be built in America. Hence, the final decision to go ahead on the "Cardinal" may never be made.

Aluminium Consumption

The introduction of four more aluminium engines indicates that this development will boost passenger-car requirements by more than 14 per cent., to a net consumption of at least 190,000 tons of aluminium for the 1961 model year (Fig. 1).

Mr. V. E. Flaherty, automobile industry manager of Kaiser Aluminium, indicated that the actual use per car for 1960 was 54.4 lb. of aluminium per vehicle. The Kaiser survey shows an average requirement for 1961 of 62.1 lb. per car, based on a 6,000,000 figure of new cars. The new aluminium-engined cars for 1961 are: Oldsmobile new "F-85," which will require 134.9 lb. of aluminium in the V-8 engine block (the complete engine weighs 325 lb. as against nearly 600 lb. when cast iron was used). The new Buick "Special" will require 132.6 lb. of aluminium as compared with 70.3 lb. for the regular 1961 Buick, an increase of a

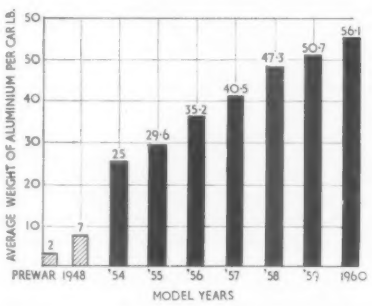


FIG. 1.—*Growth in use of aluminium in the production of American passenger cars;* 1961 *estimate:* 62 *lb. per car.*

little more than 1 lb. from the 1961 model. The American Motors' "Rambler" will be equipped with a die-cast six-cylinder engine block, with cast-iron liners and cylinder-head. The company has reduced engine weight by some 80 lb. from last year and, at the same time, nearly doubled the use of aluminium from 62 to 120.6 lb. for the 1961 version. The Kaiser survey reveals the following use of aluminium per average car for the year 1961, compared with 1960:—

	1960.	1961.
American Motors'	55.3 lb.	96.4 lb.
General Motors'	52.3 ,,	64.5 ,,
Chrysler	68.7 ,,	63.3 ,,
Ford	52.9 ,,	55.2 ,,
Studebaker-Packard	17.7 ,,	25.2 ,,

National Die-Casting Exposition

One of the most popular displays and the subject of much discussion at the recent National Die-Casting Exposition in Detroit was the six-cylinder aluminium engine-block being used by American Motors in its "Rambler." It is the most complicated industrial part yet produced by the pressure-die-casting method and is claimed by Doehler-Jarvis Division of the National Lead Company as a "break-through" in the automobile industry and the beginning of a new production movement. One of the company's engineers, Mr. A. F. Bauer, is reported as saying: "Grey-iron engines will be changed gradually to aluminium blocks and this transition from one to the other will take several years. This will permit the full test of aluminium as an engine material. The adaptability of aluminium and its alloys to modern labour-saving casting methods is aluminium's biggest advantage over grey iron. It may take time until these advantages are realized."

Effect of Production of Castings

The market for castings in the US automobile industry will not diminish as a result of the change that occurs where aluminium is substituted for cast iron or where other materials, such as steel or malleable, are replaced with cast iron. In fact the overall use of castings is likely to increase.

Assuming that each car consumes 1,000 lb. of castings, an annual production of 6 million cars implies need for 3 million short tons of castings. It is within this 3 million ton market that the struggle for cast products will persist. To many existing castings, there is little threat of immediate replacement. For example, zinc-base die-castings have enjoyed increasing applicability, aluminium competes with zinc in the ornamental and light-duty usage, and brass and bronze will compete with aluminium and the contest is close in the case of bearings. The prevailing struggle between the aluminium cylinder-block and -head and its established cast-iron counterpart is too recent to predict a decision, but the gradual encroachment of aluminium castings for crankcases, gearboxes and similar applications indicates that sufficient economy prevails in the change to warrant making such replacements. The contest between the cast camshaft and its forged competitor will continue, but the cast crankshaft is increasing its popularity through its installation in many of the new compact cars.

The important present competition between cast iron and aluminium for the motor-block casting opened when General Motors launched the "Corvair." Of the ten new compact cars entering production in 1961, seven offer aluminium cylinder-block engines (see Table 2). Preliminary discussions built up the case for aluminium by the 1959 progress report to foundrymen, presented by Mr. R. F. Thompson of the General Motors' Research Laboratory at the Gray Iron Founders Society's convention in 1959. This was followed by an article in March, 1960, on the same subject. It prepared the trade for coming events, and the following charts and table on the properties, wear-resistance and weight trends, present Mr. Thompson's opinion of existing casting requirements. Problems in machining, wear- and corrosion-resistance and pressure-tightness were admitted and dealt with quite fully (see Figs. 2 and 3 and Table 3).

American Automobile Developments

In an article in the June issue of *Modern Castings*, Mr. C. A. Sanders commented on the challenge of aluminium to cast iron and pointed out some of the misleading statements which promised less weight in the engine, when actually little or no difference existed. The actual difference between a grey-iron engine and an aluminium one amounted to 7 lb. of the total weight. This leads to recently reported comments from the Ford Motor Company, namely, that "we have pioneered with light-iron engines for many years and we believe that they possess superior qualities in relation to aluminium engines at this time." Mr. Sanders mentions in his article the economics of machinability, corrosion resistance, expansivity, plus others which enter the case in assessing the overall costs of aluminium *versus* cast-iron castings. It is obvious that aluminimum at $600 per ton* in competition with cast iron at about $60 per ton* must needs provide many borderline benefits which contribute to the ultimate economy of its application as engine material. Production of cast iron follows the greensand-mould and dry-sand core, machine-moulded production-line methods for cylinder-block castings, and dry-sand and shell moulds for cranks, cams and similar castings help keep these important castings, with their advantageous mechanical properties, in the iron foundry.

TABLE 2.—1961 *American Aluminium-engine Specifications.*

	Buick Special.	Oldsmobile F-85.	Pontiac Tempest.*	Corvair.	Rambler.	Plymouth, Dart, Lancer.
Type	V-8	V-8	V-8	Opposed 6	Straight 6	Slant 6
Weight (lb.)†	105	105	105	80	64	115
Compression ratio	8·8 : 1	8·75 : 1	8·7 : 1	8 - 1	8·7 : 1	8·2 : 1
Displacement (cu. in.)	215	215	215	145	195·6	225
Brake horsepower	155	155	155	85	127	101
Curb weight (cwt.)	24·4	24·0	25·0	21·5	26·5	Variable

Source: Alcoa. Rambler and Chrysler cylinder-blocks are pressure-die-cast; the Corvair case is pressure moulded; the Corvair cylinder-head and B.O.P.-blocks and heads are semi-permanent moulded.
* Optional.
† Does not represent "total" engine weight, but includes cylinder-head weight if aluminium. Rambler and Chrysler cylinder-heads are of cast iron.

TABLE 3.—*Comparison of Physical Properties of Two Types of Aluminium and Cast Iron.*

Alloy.	Tensile strength, lb. per sq. in.		Fatigue strength notch.	Elastic Mod. × 10^6 lb. per sq. in.
	As-cast.	T-7.		
Aluminium "355"	9–11	15.6	3.1–3.6	10.3
Aluminium, 19 per cent. Si	9–11.6	14.0	3.1–3.6	13.5
Cast iron	13.4–15.6	—	5.4	13.16

Cores made of sand are too friable to lend themselves to mechanized assembly without considerable risk, whereas metal dies can be manipulated mechanically through the jig-saw type of assembly necessary to make a typical motor-block. Therefore aluminium would have to possess foundry processing advantages to make its use economical. Gravity-die-casting of small parts, such as carburettors, parallel the production methods used for aluminium. These practices are well established and have been frequently described in foundry literature. The recent enthusiasm over aluminium leads to frequent descriptions of its production into castings in current magazine articles.

* The specific gravity of cast aluminium is about 2.56 as compared with about 7.20 for cast iron—EDITOR.

Practice at General Motors

The Central Foundry Division of the General Motors Corporation is casting aluminium cylinder-blocks and -heads for the new lightweight V-8 water-cooled engines, introduced by three G.M. car divisions. This is the first time that an American foundry has successfully mass-produced aluminium cylinder-blocks and -heads. Since 1948, the Defiance plant of General Motors has been mass-producing grey-iron V-8 blocks and heads. The method of production used for these aluminium units is as follows. Cylinder blocks are produced in semi-permanent mould machines. They are hydraulically operated and use both water-cooled metal dies and disposable sand cores, the cores being positioned in the mould cavity to form the water-jackets and crankcase. Pre-cast grey-iron cylinder liners or sleeves are heated, placed in the mould, and cast integrally within the block. The block-making process is unique in that the castings are poured in a vertical position rather than the horizontal position used in casting of grey-iron blocks. Cylinder-heads for the overhead-valve engines are cast in a horizontal position in the mould to form the water-jacket and ports.

Aluminium is prepared in four gas-fired, 18-ton reverberatory furnaces. The molten metal is transferred to 15-cwt. gas-fired holding crucibles at the moulding platforms and tapped into 100-lb. pouring ladles as required. After the castings have cooled, the gates, feeder-heads and sprue are removed in automatic-transfer machines. Following machining, the castings are heat-treated to relieve stresses and provide dimensional stability. Block castings are processed through an automatic "qualifying" machine which established the starting points for machining, and are given a final quality-check on a specially-designed gauging machine which checks 22 separate points on each casting.

Other Manufacturing Procedures

In the issue of September 22, 1960, of the

FOUNDRY TRADE JOURNAL, a description was given of the Alumasc process developed in Britain for low-pressure aluminium castings, and the Karl Schmidt low-pressure process, originating in Frankfurt, Germany, is also being licensed at the Massena Works of General Motors. These overseas activities clearly indicate that European manufacturers have had access to and control of desirable manufacturing procedures.

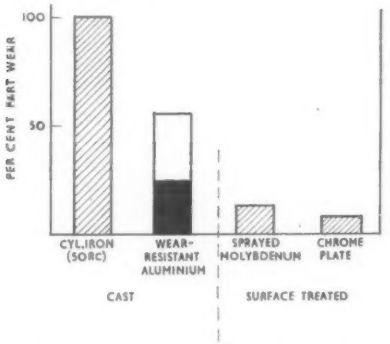


FIG. 2.—*Relative wear-resistance of aluminium and cylinder iron, compared with plated materials. (The grade of aluminium for which comparisons are made is one experimentally developed specially for improved resistance to wear).*

Aluminium and the American Market

In the US, only the small two-cylinder auxiliary engine, used on motor-boats, and mechanical devices such as portable saws, have so far occupied the "all-aluminium" engine-block market. Pistons have been chromium-plated to provide good wearing quality. Some aluminium engines for motor-cars have been reported in production in Europe.

These conditions would indicate that imported cars will survive the threat that is posed in the present US models. The imported car is usually smaller and possesses the required styling, serviceability, worthiness and economy that is desired by the purchaser of low-cost transport. Current jokes point out that no other country, save America, has bigger "compact" cars or more expensive "economy" models. The competition of US exports on European markets is as remote as ever. In the UK, for example, due to astronomical import-duties and purchase tax, US compact cars would sell at about 2½ times their US price.

Actual differences in cost between aluminium and cast-iron engines are not items on public record. Speculative deductions, which appear in the financial Press, attribute the 34 per cent. loss in profit in the General Motors' third-quarter statement to adjustments in manufacture and "changeover" to new models. To quote from a news item in the American Press: "General Motors has never publicly admitted that thin margins on the 'Corvair' have been holding back earnings this year, but the financial community has been taking it for granted. Neither has the auto firm revealed its profit margins on the small cars, nor their tooling costs or the way in which it is being written off."

Acceptance of the new compact cars and their aluminium engines will be settled in the sales rooms of US dealers. All the promotional resourcefulness of the builders has been turned loose to create sales. A decision on a long-term basis will be made and will depend upon economy. Delivering the necessary horsepower to the consumer in America could be achieved by low-cost manufacture of high-cost aluminium, in competition to the reverse position of cast iron. This situation is significantly a US problem in which high labour-rates, plus plentiful aluminium, might succeed in the US and be doomed to failure elsewhere.

Advantages and Disadvantages

The proposed advantages and disadvantages of the use of aluminium as against cast iron are largely in engineering properties and can be set out as follow:—

Advantages

Amongst the advantages which can be put forward for the use of cast iron are established performance, rigidity—good damping capacity, adequate strength, un-used strength, good machinability, congenial expansivity, established corrosion-resistance and wear-resistance, and low cost of raw material.

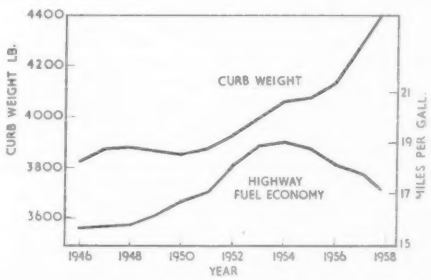


FIG. 3.—*Graph showing trends in weight and fuel economy in passenger cars. (Development of more-efficient engines after world war II offset increased vehicle weight until the advent of automatic transmission in* 1954.)

On the side of the use of aluminium can be listed less weight per unit, quicker warm-up, cooler operation, less weight in engine, saving in weight for supporting members (*e.g.*, 20 lb. saved per engine may provide a saving of 120 lb. in the weight of the car), lesser dynamic load (needing smaller sections to sustain vibratory and fatigue loads), low labour-costs, use of die-casting and prospects of further quite rapid development.

Disadvantages

Taking cast iron first, the disadvantages can be enumerated as:—more weight per horsepower,

American Automobile Developments

high costs of moulding and coremaking, mould assembly and cleaning. Turning to aluminium, disadvantages include:—poor metal to metal wear, need for inserts, less heat-resistance, problems relating to thermal expansivity and corrosion, greater cost for assembly and insert manufacture, expense of die material and high cost of die-making.

Prospects for Developments

Next, it is important to deal with future prospects and possible developments of both cast iron and aluminium. In the case of the former, it is possible that the strength of the iron may be doubled, thinner sections could be produced, and the finish of grey-iron castings and their dimensional accuracy might be improved. Added to the foregoing might be added the possible development in the reduction in weight of iron castings, possible extended wear-resistance (by heat-treatment), and the use of die- or precision-casting in the manufacture of the iron castings.

In the field of aluminium, developments possibly lie in improving machinability, wear-resistance, and corrosion-resistance; the possibility of eliminating the need for the use of inserts, improving heat-resistance, and reducing the cost of assembly of moulds.

"Proving Ground"

The new compact cars have become the proving ground for the US competition between aluminium and cast-iron engine-blocks, and designers and engineers have done their work well. Foundrymen in the US have adjusted their production methods and research engineers have established basic principles, but still have much further to go. However, in the long run, it is the ultimate consumer who will settle the case on the salesroom floor by his assessment of personal transport and its cost.

Addenda

Side-effects arising from trends reported in the above account of the American car industry, *vis à vis*, castings production and demand, are as follow:—

(1) The American wrought steel industry is concerned about the loss of 25 per cent. of the tonnage of its productions used in automobile manufacture which is likely to arise through the development of the lighter-weight "compact" cars. Normally, 10,000,000 tons of steel would be used for an output of 7,000,000 cars.

(2) The trend toward four- and six-cylinder engines, replacing six-and eight-cylinder jobs, deprives piston-ring manufacturers of approximately 25 per cent. of their market. Some of this decline, however, is expected to be balanced by production of sleeve (liner) castings for the 1961 aluminium cylinder-block engines.

(3) On the aluminium side, extensive laboratory testing is in progress in an effort to eliminate necessity for the cast-iron sleeve and run on an all-aluminium basis.

(4) Cast crankshafts of pearlitic malleable-iron increased the usage of castings in 1961 automobile engines as the production moved into the new compact models.

(5) Tyco Engineering Corporation of California, has produced a brazed, sheet, stainless-steel, engine-block. Made into a four-cylinder model, it was exhibited at Detroit recently, produced from grade 302 (18-8) stainless steel—the same grade as that used for pots and pans. It is claimed to produce 175 h.p. for its 175 lb. weight. Though its manufacture requires skilful brazing tactics, it has a substantially lighter weight and is said to resist corrosion better than cast iron.

(6) The growing popularity of the compact cars is cutting into the Government revenues where taxes are based upon horsepower. This reduced income, along with lower income from fuel taxes is confronting local Governments with several problems, but the automobile industry has countered misgivings here with the prospect that an increase in motor-car usage should balance decrease in tax revenue per car.

Steel Record again

November was the first week in which the weekly average steel production has exceeded 500,000 tons. At 504,500 tons a week it was 7,500 tons above the previous highest reached in October, and 46,000 tons a week—or 10 per cent.—above the result for November, 1959, the Iron and Steel Board reports.

Pig-iron production followed the same record-breaking course. At a rate of 315,000 tons a week for November, it exceeded the previous record set up in October, by 1,185 tons a week. The November output exceeded the figure for November, 1959, by 37,700 tons a week, or 13 per cent.

Latest pig-iron and steel output figures (in tons) with the corresponding 1959 returns are shown in the following table:—

Period.	Pig-iron.		Steel ingots and castings.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
1960—September ..	305,800	15,900,000	481,000	25,012,000
October ..	313,000	16,321,000	497,000	25,842,000
November ..	315,000	16,382,000	504,500	26,234,000
1st 11 months	302,900	15,750,000	468,800	24,376,000
1959—September ..	251,100	13,057,000	426,400	22,171,000
October ..	269,800	14,029,000	441,400	22,953,000
November ..	277,300	14,422,000	458,600	23,847,000
1st 11 months	237,900	12,370,000	383,400	19,939,000

New Nickel Project

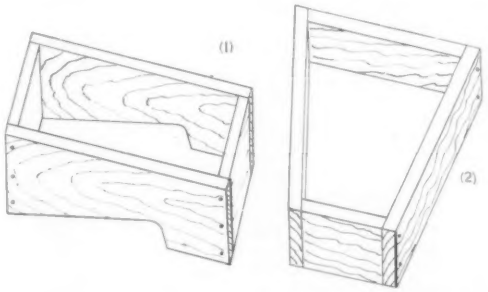
The International Nickel Company of Canada, Limited, are currently mailing to customers and prospective customers, a pamphlet providing up-to-date information about their new nickel project at Thompson, Manitoba, now rapidly nearing completion. The project is scheduled to begin commercial operation early 1961, and will, it is stated, have an annual capacity of at least 33,500 tons of nickel, raising the company's total nickel production capacity to more than 172,000 tons per year.

Turnover-frames

By "Checker"

Where possible complex cores are made in sections that offer flat surfaces for turn-out. Bedding-out lengthens coremaking time and ways of avoiding it are always sought. Where, however, irregularity of core surface leaves no alternative, turn-over frames are of great assistance. Their construction and application are detailed below.

Turnover-frames are sometimes used to support the bedding-out sand while the core is being turned out. Apart from turn-out, they are often used for cores that have no flat face on which they can stand while being dried in the oven, and must therefore rest on a cradle of sand to ensure that their shapes will not be distorted or damaged, during the drying process.



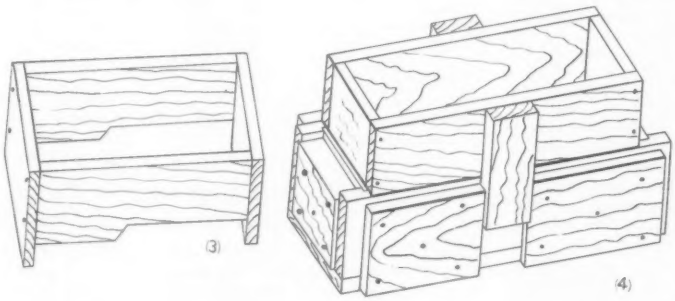
FIGS 1 *and* 2.—*These two frames represent relatively simple examples of turnover-frame practice. In the left hand* (1) *illustration the symmetrical scallops out of the sides follow the strickle edge of the corebox. Not all coreboxes are square or rectangular and the frame on the right* (2) *follows a less usual shape.*

Construction

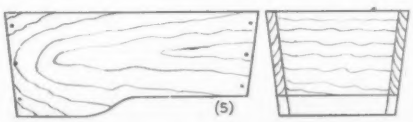
These frames are usually made in wood, and should on all occasions have a level top, on which a flat-plate can be placed for turn-out purposes. The bottom of these frames must always be made to fit the corebox joint, whether it is of a straight or irregular shape.

The application shown in Fig. 1 is of a turnover-frame which rests on an irregular-shaped corebox joint. In many instances the wooden frames are of square or rectangular shape. However if desired, the patternmaker can make the outside sizes to any other shape, to correspond with the core and corebox with which it will be used. Fig. 2 illustrates a turnover frame which is tapered in its length, and in this instance fits on a flat corebox-joint.

Another type of turnover-frame sometimes used with open-end coreboxes, is shown in Fig. 3. Here the ends are made deeper than the sides, a method of construction that enables them to fit over the corebox ends, while the sides are positioned on the corebox joint. Sometimes a careful draw must be made when removing the half-corebox, owing either to frail core-sections, or deep parts with very little taper, that could be easily damanged or broken. On these occasions the addition of legs at each side of the turnover-frame should be used.



FIGS 3 *and* 4 (*alongside*).—*The ends of the frame are lengthened to support a core made in an open-ended corebox, on turn-out. To assist in stripping a fragile corebox, legs on the frame* (4) *key into the corebox.* FIG. 5 (*below*).—*Side-view and end-section showing liberal draft on the frame sides to assist its withdrawal.*



This allows a controlled lift of the half-corebox from the core to take place. Fig. 4 illustrates this type, and is shown seated on the half-corebox. The legs are made parallel, and fit into slots cut at each side of the corebox. These slots are cut out of the corebox side, or if preferred, side battens can be used as shown. On larger coreboxes it may be advisable to incorporate three or four legs if this is practicable.

Turnover-frame

It is an advantage on all these wooden turnover-frames, to allow a reasonable taper where possible on ends and sides. This facilitates the eventual stripping of the frame from the cradle of sand on which the core is seated. Care should be taken that any taper is outwards from the face which rests on the corebox joint as illustrated in Fig. 5.

Where larger scale production is required, but not sufficient to justify the use of cast-iron drying-shells or cradles, turnover-frames would often be found more serviceable if produced in aluminium instead of wood.

LD Steelmaking spreading

In addition to the 21 steelworks already using the Austrian-developed Linz-Donawitz production process in various parts of the world, a further 35 LD plants are projected and in construction. The process accounts for over 56 per cent. of steel output in Austria.

New plans for the utilization of the process have in the past few weeks been announced from a number of different quarters. India's oldest State-run steel plant, that at Bhadrevarthi, in Mysore, is to extend its annual capacity from 30,000 to 130,000 *tonnes* by use of new LD equipment; this project will be carried out in co-operation with the German companies Demag and AEG.

With Japan's fifth LD plant having opened at the Amagasaki steel site at Osaka within the month, a delegation from the Austrian steel group, VOEST, is already conducting negotiations in Tokyo for the opening of further such units. Mr. Katsura, president of the country's Iron and Steel Corporation, has announced in this context that Japan will use the process to raise annual steel output from its present level of 22,000,000 tons to a future 45,000,000 tons.

VOEST itself is to build an LD plant in Rumania's new steel complex at Galata. From Africa comes news that the South African Iron & Steel Industrial Corporation, Limited, is interested in starting negotiations with Austria aimed at the introduction under licence of the process at its new steelworks at Pretoria and Vanderbijlpark to double existing capacities there.

The interest for iron and steel founders in the extending use of the LD process lies in the fact that it is a hot-metal process, *i.e.* it produces steel by oxygen blasting of metal direct from the blast-furnace. On the long-term basis, therefore, it is likely to run counter to the present increasing demand in the ingot-producing industry for scrap steel for melting in large electric furnaces. Presumably, the net ultimate effect could be to release more ferrous scrap for use in foundries. It should not be forgotten also that the LD process can be operated successfully on quite a small scale and may, therefore, become of interest as a metal producer for steelfounders.

THE SOVIET UNION is said to have offered contracts worth about £14,000,000 to VOEST, the leading Austrian steel combine, for four steel plants based on the LD oxygen process.

ROLLS-ROYCE, LIMITED, Derby, are commissioning a stained-glass window in Westminster Abbey in memory of one of their founders, Sir Henry Royce, who died in 1953. Derby Town Council has been asked to approve the incorporation of the Derby crest in the design.

The Theatre and Cast Iron

By C. J. Robb

It might be asked what rôle cast iron has played in the theatre. The answer is that it is a greater one than would be supposed. In the 18th century the gallery was supported by cast-iron columns to carry the wooden beam, and the casting was encased in wood or plaster. This cast column later in the last century became ornamental in the moulded iron and even the styles of classical architecture were reproduced. The brick-arched fireproof floor of the first decade of the last century, with the inverted fish-bellied cast-iron beams, came into use, and the theatre, as well as the warehouse and factory, had its quota of this form of construction for the gallery. Cast-iron gallery front panels came on the scene in the 1850s. Before the days of Captain Shaw's fireproof curtain a Manchester iron-founder had the idea of using sliding cast-iron slabs to close off the proscenium opening. These were to be mounted on rollers and drawn by two winches. Cast-iron firedoors were used in some theatres in the closing decades of the last century.

Iron casting shone at its best in theatre lamps and candlesticks from the middle of the 18th century on. The one illustrated here is from the old Theatre Royal of Belfast and is a most beautiful piece decorated in red and gold enamel and suspended by a chain encased in a red fabric tube, twisted cable-like. Footlight boxes were cast, and the case for the limelight was also in some cases made as a light casting, supported on a wrought-iron bar mounted on heavy cast-iron claw feet.

There is no doubt that the founder's art was very much at home in the theatre and struck the first chord in fireproof construction.

Delta consolidates Non-ferrous Metal Production

Following the recent disposal of its copper-alloy tube production to Yorkshire Imperial Metals, Limited, Delta Metal Company, Limited, is consolidating various departments concerned with the manufacture of drawn brass-wire strip and sections, high-conductivity copper, phosphor-bronze strip, and similar products. These departments will, in future, operate under the name of Heaton & Dugard, Limited, Argyle Street, Birmingham.

Mr. George Meredith has been appointed sales director of Heaton & Dugard, Limited, in consequence of which James Booth Aluminium, Limited, has agreed to release him from his present duties as sales director with effect from December 31, 1960.

Offices Act 1960 : New Obligations on Occupiers

By "Barrister-at-Law"

Steps for the protection of the health and for the safety and welfare of persons employed in offices (which, of course, includes all foundry offices), have now been taken by the Government. An important new law has been introduced by the passing of the Offices Act 1960, an Act which both employers and employees should carefully study. To a considerable extent, persons working in offices are to be brought into line with persons employed in factories and shops. Having regard to the far-reaching operation of the new law on this subject, a summary of the provisions of the Act may serve as a guide to all who may be affected by it.

Health, Safety and Welfare

The Act requires the provision of sanitary conveniences (with separate accommodation for men and women), adequate washing-facilities, suitable lighting, ventilation, heating, cleaning, and accommodation for coats and hats and the like. Steps must also be taken to prevent overcrowding, to provide sufficient means of escape in case of fire, to ensure the provision of adequate supplies of drinking water, to keep first-aid equipment properly maintained, and to secure the regular inspection and maintenance of electrical equipment. Furthermore—and this is a point by no means to be overlooked—the dangerous parts of any machinery of equipment used in an office must be properly fenced. This is the aim of the Act, and in order to further it, Regulations are to be made after due consultation with the organizations concerned.

Definition of "Office"

The Act as its title states, applies to "offices"; and for this purpose an "office" will include any *room* which is *substantially* used for clerical work, including bookkeeping, filing, typing, duplicating, drawing, the editorial preparation of matter for publication, the sorting and carrying of papers, telephone operating or the handling of money.

The occupier of the office is required to post up a notice containing a copy of an abstract of the Act and of the material Regulations, in the manner prescribed by the Regulations. This notice must be posted in a prominent place, where it can be clearly and readily seen and read by every employee. The notice must also be maintained in a legible condition. To pull down, injure or deface any such notice will be an offence. In this connection moreover, it should be noted that an employee who wilfully interferes with, or misuses, any equipment, appliance, facilities (*e.g.*, for washing, drinking and the like), or any other thing which is provided for the health, safety and welfare of the persons employed in the office, will be guilty of an offence.

In the event of a fatal accident occurring to an employee, or in the event of his or her disablement for more than three days from earning full wages, the occupier must send written notice of the event to the local authority. If the office is one in a foundry, the notice must be sent to the Inspector of Factories for the district. Likewise, if the office is one in a mine or quarry, the notice must be sent to the Inspector appointed under the Mines and Quarries Act 1954. Offices in foundries, or in mines or quarries, it should be observed, come within the jurisdiction, not of the local authority (as offices in general do), but of the appropriate Inspector appointed under the Factories Act 1937, or under the Mines and Quarries Act 1954, as the case might be.

Trade Secrets

As Inspectors (whether appointed by the local authority in relation to offices in general, or under the Factories Act 1937, or the Mines and Quarries Act 1954) have express powers of entering premises and making examinations and enquiries in order to see whether the provisions of the Act are being observed, it is obvious that there will be some risk that trade secrets may be disclosed. The Act, however, specifically provides safeguards for the occupier, for a prohibition is imposed on every person who thus enters the premises for such purposes, against disclosing to any person any information obtained by him in the office, with regard to the trade or business carried on by the occupier. Breach of this obligation will entail a fine not exceeding £100, or imprisonment for a term not exceeding three months.

Effect of the Act on Leases

One consequence of the importance of these new obligations on occupiers of offices, is likely to be that structural or other alterations may become necessary in order to provide the various facilities, or otherwise to comply with the requirements as to securing the health, safety and welfare of the persons employed in the office. If the premises are held under a lease or tenancy agreement, there may be some clause which would restrict the occupier as tenant from making the necessary alterations. If agreement cannot be reached with the landlord on the point, the tenant is given by the Act the remedy of applying to the County Court of the district for an order which will either cancel or modify the particular clauses in the lease or agreement.

A tenant occupier need not necessarily bear the whole, or indeed any part, of the cost of making the alterations to the property. The cost may be apportioned between himself and others having an interest in the property, such as the freeholder or a superior landlord or a sublessee, and even it seems, lessees of other parts of the property in which his own premises are comprised.

American Letter

US Foundry Economics

The "roaring sixties" with which business prospects in the US were greeted at the beginning of the year have quietened down to a complaisant "purr," with an occasional furtive look into the foggy future for a lead to a course of action. An index of consumer purchasing-power, namely housing, indicates that commitments to build new housing units is down to an annual rate of one million units for September, 1960, compared with 1½ million for 1958 and 1959. The backbone of maintenance, replacement and modernization of business and manufacturing plants and construction is keeping going a steady rate of employment. The "fringe" benefits from these activities, such as purchasing of motor cars, sales of appliances, luxury products, etc., decrease with shorter working weeks and hence, "leaner" pay packets. The more-cautious purchasing that results weakens a market which, however, still remains the most attractive in the world.

US goods, such as motor cars, have found their markets challenged by well-made, attractive, low-cost, foreign-built ones moving rapidly into a high-priced goods market.* Many other US products are priced out of the world market and US prices for these goods at home are an attractive "lure" for the products of enterprising foreign manufacturers. Imports of steel, brass and aluminium shapes (but with a lower influx of castings such as pipe-fittings) sound the warning that US indifference to costs may mean the loss of markets. The manufacture of parts at foreign sources and their assembly into finished products in the US is the reverse of a long-regarded American prerogative of producing mass volume in the US and assembling at the end using foreign sources. Plans for casting and assembling automobile engines abroad and installing them in US cars signalize the movement to equalize the economic unbalance in a world that in terms of business has become smaller, more compact, and where the well-being and welfare of neighbouring nations becomes a matter of mutual dependability.

The influx of foreign goods in the US is, in general, less than 10 per cent. of the prevailing domestic volume. This would seem to be a tolerable amount, but when domestic volume is excessively low, the desperate need for additional domestic volume may drive business managements to correspondingly extreme demands upon trade-control bodies. Since the US is more accustomed to buying foundry products than to selling them, the controls are less likely to stimulate exports and more likely to curb imports.

Metal and Labour

Softening prices for copper, aluminium ingot and steel scrap illustrate the sharpening competitive battle for markets amongst foundry commodities. The more efficient use of labour—which in the US is the highest-priced in the world—makes managements' problems of operating profitably a difficult one in the domestic market and impossible in the foreign market. Current items bearing upon this last point are: The 33.00 cents per lb. price for custom-smelter copper collapsed on a 2-cent cut by American Smelting & Refining Company, followed quickly by others who wished to meet the competition. (The 33-cent price was established last March). The reduction means pressure for a cut in the price of the copper ingot and casting alloys wherever these have not already been made. Leading smelters of aluminium-alloy ingot reduced the prices of their products by one cent per lb. across the board, this reduction following on the heels of a reduction in scrap price. The major US casting aluminium alloy, No. 380 (with 1 per cent. zinc) is now quoted at 23 to 24 cents per lb., with 3 per cent. zinc grade three to four cents per lb. lower.

* See also page 787 of this issue.

Pipes and Machine-tools

The US Pipe & Foundry Company, the largest producer of cast-iron pipe in the US—states that the housing slump is hitting sales. Mr. R. E. Garrett, the company's president, said in a recent interview that the general economic conditions and reduced level of home-building were the main factors affecting his company's operations. He pointed out that house-building projects were not moving as they did last year, which meant that fewer sales of pipes and fittings would be made to builders.

Kearney & Trecker Corporation—an important machine-tool building firm—reports: "Shipments and new orders for the year are running 30 per cent. higher than in the previous year." Mr. F. J. Trecker, president, said that despite this improvement, heavy development costs kept operations "in the red" through the first half of 1960, and he predicted that as businessmen gain confidence, they will begin to spend money for capital goods and the economy will hold its own rather than slip further. The primary reason for the company's sales growth this year is the Milwaukee-matic machine, a tape-controlled unit capable of cutting costs sharply on low-volume production operations. Shipments of this new machine will total $10,000,000 for the fiscal year of 1960 against $3,000,000 to $4,000,000 the previous year, Mr. Trecker said. The new machine was also the chief factor in the company's high development costs.

The Export/Import Bank of Washington has granted Industrias Kaiser Argentina a $1,000,000 credit to purchase US machinery for the production of the Renault "Dauphine" at its Cordoba plant in South America. I.K.A., an affiliate of Willys Motors, Inc., Toledo, Ohio, said the Dauphine project calls for an investment of $11,000,000 and will raise its output to 50,000 vehicles a year.

New PR Locomotive

Recently, the Pennsylvania Railroad exhibited the first of a fleet of 66 high-speed electric freight-locomotives which will be placed in service soon. Rated at 4,400 h.p., and able to pull a freight train of about 150 cars of 60 tons each at 70 m.p.h., the locomotives will have a unique feature in their warning bells, which were removed from scrapped steam locomotives. Mr. A. J. Greenough, president of the Pennsylvania Railroad, commented: "We thought it would be a nice touch to have the more-resonant cast-bronze bells of another era of railroading on the new units. Such bells are practically indestructible in service, but are now prohibitively expensive to manufacture." The new engines will cost about $500,000 each.

Equipment Sales in 1961

According to a recent survey, nearly 70 per cent. of US foundries expect to buy new equipment in the coming year. In this respect the survey points to the importance of the 1961 AFS Castings Congress and Exposition to be held in San Francisco from May 8 to 12 at which a wide range of foundry and materials-handling equipment will be on view. The survey indicates that in 1961 nearly 72 per cent. of US foundries will invest in moulding equipment and 59 per cent. in materials-handling machinery.

Instrumentation in a Steel Foundry*

Electronic System for Weighing Charges

A new electronic system for weighing charges is employed at General Steel Castings' Granite City (Illinois) plant in the USA. The instrumentation is stated to provide three specific benefits: More melts per shift, greater uniformity from melt to melt and automatic recording of types of scrap in each batch. These benefits, it is stated, are being realized in the production of manganese-steel and other alloyed-steel castings such as bowl liners, mantles and "concaves" for heavy-duty crushing equipment.

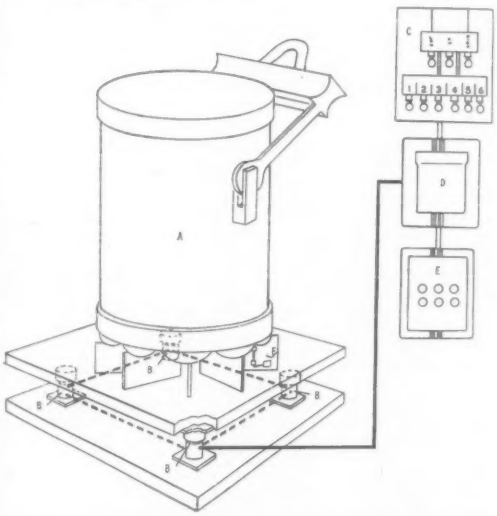


FIG. 1.—*Main features of the automatic system used at General Steel Castings, USA, for weighing scrap, prior to charging and melting in the electric furnace. The weight for each type of charge material (from one to six ingredients) in the bucket (A) is cumulatively set at control-point unit (E); load cells (B) respond to the charge in the bucket and the weight is signalled to the recorder (D). Signal lights (C) are wired to respond to each control point (as well as the "low" and "high" side of the control point).*

The weighing equipment, Fig. 1, consists of a Model S Speedomax "G" recorder for totalling scrap weight, digital-control point setters for regulating the weight of scrap from each bin, the weighing station, and a series of signal-lights to indicate when the load is low, high, or correct.

The melter sets the weights for the different types of scrap at the control station and the recorder totals the weight. With the control points set and the charge-bucket in place, the crane operator begins loading the bucket with scrap from No. 1 bin. The signal lights located on the wall above the bucket then indicate when the load is low, high, or at the correct weight. Settings are cumulative, being set, for example, as follow: Station one is set at 3,000 lb. for 3,000 lb. of scrap from bin No. 1; station two is set at 6,000 lb. for an additional 3,000 lb. of scrap from bin No. 2; station three is set at 11,000 lb. for an additional 5,000 lb.; stations four and five are set in the same pattern, and station six provides for the addition of another ingredient if necessary.

Charging

When the batch is completed, the furnace is charged and the scrap melted. The 9-ft. dia. electric furnace used has a melting capacity of 8½ tons and a transformer capacity of 4,000 kva. As the melting proceeds, chemical analyses are made at regular intervals and additions are made as required. Before the melt is poured, a temperature reading is taken with an expendable immersion thermocouple. (General Steel Castings has found that the best results are achieved by casting as cold as possible). The use of the expendable thermocouple permits pouring moulds at metal temperatures very close to optimum values.

Because of the advantageous power rates which apply at night-time, the electric furnace is operated during the 9 p.m. to 7 a.m. shift and, during this period, four melts can be made as a result of the efficient material-handling equipment and modern instrumentation described above.

* Extracted from *Industrial Heating*.

New Marking Regulations

Having converted to the metric system, the Indian authorities have agreed to accept shipments marked with weights in avoirdupois units until February 1, 1961. After that date the weights of each package or piece of freight must be marked in metric units on two sides and for pieces of over three tons the weight must also be marked on top.

Since this may not be possible in the case of certain cargoes, such as iron and steel, shippers should ensure that the metric weight is marked on a tab attached to the items.

ADDRESS OF N.U.M.A.S., Limited, is now Auckland House, New Zealand Avenue, Walton-on-Thames. (Telephone: Walton-on-Thames 24071-5).

AGREEMENT CONCLUDED between the Viking Pump Company of Cedar Falls, Iowa, USA, and Zwicky, Limited, Slough (Bucks), provides for the latter company to acquire the exclusive rights to manufacture and sell in the UK the full range of Viking pumps. Zwicky, Limited, founded in 1923, was acquired in 1930 by G. & J. Weir, Limited, engineers and founders, of Glasgow.

Equipment and Supplies

Dust-control Unit

A further range of "Unimaster" dust-control units is announced by Dallow Lambert & Company, Limited, Thurmaston, Leicester. The new system comprises a conventional dust-control unit, fitted with an angle flange at the base of the filter chamber which allows the unit to be mounted on large storage containers. It is contended that the new units have many applications, *e.g.* they can be used in wood patternmaking industry where the normal 4 cu. ft. dust container is too small to take the large volumes of wood waste and sawdust produced on such machines as planers, or collected from a number of saw-benches or, in certain instances, from small multi-head machines. The "Unimaster" H-type dust-control unit is available with a patent sack-tipping attachment and can be fitted on top of hoppers, along with rotary valves for taking the collected dust back into conveying systems. The latter type units are available in 70, 100, 150 and 250 series (70 to 250 sq. ft. of filter area respectively) with fan capacities up to 2,000 cu. ft. per min.

Liquid Sampler

Equipment (known as type WS.1) made by Elcontrol, Limited, Wilbury Way, Hitchin, Herts, is a self-contained battery-operated portable unit, which automatically takes liquid samples at regular intervals from channels, streams, tanks, etc. The sampler can also be used in laboratories and pilot plants and can, it is stated, extend the usefulness of any control laboratory by allowing a sequence of tests to be made over a fixed period. The sampler case is constructed of mild steel with an aluminium outer shell, thus keeping weight down to a minimum, whilst retaining maximum rigidity and strength to withstand rough handling under arduous conditions. The case is rendered watertight by the use of neoprene rubber sealing gaskets on the doors and is provided with rubber feet. Foundry applications for the sampler would seem to include use in repetitive testing of acidity of cupola exhaust spray-water and cooling-water testing generally.

Face-shield for Women Employees

The wearing of safety equipment is often objected to by women employees on the grounds of its unattractiveness. To overcome this difficulty, Safety Products, Limited, Holmethorpe, Redhill, Surrey, have introduced the "Clearways" face-shield, which has been designed to satisfy both practical and aesthetic considerations. It is light in weight, the head band being made from a light-weight fibre, and the usual leather sweat-band has been replaced by a self-adhesive band of sponge-like urethea. The brow guard, whilst being tough, is made of a plastic material "Celastoid," and is available in six attractive colours; the detachable vizors, too, are made from clear non-inflammable Celastoid. Press fasteners inside the brow guard prevent liquids running down the rear of the vizors. The vizors are supplied in three depths, 4-, 6- and 8-in. respectively, and are made in two thicknesses of either 0.30 or 0.40 in.

Outriggers for Mobile Cranes

Steels Engineering Products, Limited, Crown Works, Sunderland (designers and manufacturers of Coles cranes) have introduced a new development, aimed to increase the scope and use of truck-mounted and self-propelled cranes of the types frequently used in foundry stockyards. With practically all but the smallest type of self-propelled and truck-mounted cranes, it is said to be necessary to use telescopic outriggers and screw jacks to obtain maximum lifting-capacity. The innovation (the subject of Patent application No. 16668/1959), is designed to permit forward and reverse movement of a crane with the outriggers extended, and with a heavy or even maximum load on the hook. It consists of a rocking-beam suspension bogie mounted on each of the four outriggers to replace the usual blocks or packing, each bogie having two rollers fitted with solid-rubber tyres. The manufacturers claim that this new accessory will make available to a crane of up to 25-tons capacity, duties normally possible only by the use of blocked stabilizers.

Ingot Production: Inca Steel Company, Limited, of Forncett Street, Sheffield 4, announce that, in association with Foundry Services International, Limited, they are developing a process based on the use of exothermic material for the casting of ingots and other items, arising from an invention of Mr. W. Kelsey, a director of the former company. It is claimed that the process results in ingots having a homogeneous structure which is particularly applicable to the high-speed steels, in that central carbide-segregation is eliminated. Among advantages said to result from the new process is the abolition of the preparatory work previously necessary before steel is processed for extrusion presses and the possibility of casting tools directly, and of casting in qualities of high-speed steel, which cannot now be forged or manipulated. Steel by the new process is being supplied at present only for experimental purposes. A colour film of the process has been made and is to be shown in Sheffield.

UK-German Agreement: John Brown & Company, Limited, announce that their subsidiary company, John Brown (S.E.N.D.), Limited, has concluded an agreement with DEMAG Aktiengesellschaft Duisberg for the manufacture and supply in the United Kingdom of a wide range of iron- and steel-works plant to the German company's designs. DEMAG is understood to be one of the largest and oldest designers and manufacturers of this type of equipment in Europe. John Brown (S.E.N.D.), Limited, undertakes designing and contracting for engineering products which are new to the John Brown subsidiaries, and co-ordinates the manufacture of these new products amongst appropriate works.

Wheelbarrow. W. J. Hooker, Limited, 239A, Finchley Road, London, N.W.3, have acquired the rights in this country for the sale of a new type of wheelbarrow. It is made so that the operator can tip, empty, and replace the body on the chassis without taking his hands off the handles.

Fume removal while powder-cutting operations are carried out on stainless-steel slabs has been arranged, in conjunction with a British Oxygen "Bison Mark II" cutting machine, by fan extraction through a trough let into the concrete floor below the cutting bench.

UK Agency: Wickman, Limited, announce that the sole agency in the United Kingdom for the range of mining and construction equipment built by the Gardner-Denver Company, Illinois, USA, has now been assumed by the Wickman Mining Division, Bottrill Street, Nuneaton.

Protection of Glass Moulds

Glass moulds, neck rings, blanks and related articles used in the moulding of glass containers have long presented problems to the glass industry because of abrasion of the mould surface in prolonged use. Heat-checking of the surface produces small cracks and pits, flaking, breakdown of sharp edges and loss of dimensional accuracy as a result of repolishing can soon make a mould useless. An American process which has been developed for protecting cast-iron glass moulds and related articles is based on the theory that surface deterioration is primarily the result of oxidation. The process involves the reduction of a chemical compound of nickel by heat at 900 deg. C. in a reducing atmosphere to produce a low-melting-point alloy which "brazes" to the mould surface and diffuses with it to become an integral part of the base metal. Diffusion of nickel along grain boundaries is reported to protect the metal against oxidation as the metal expands and contracts as a result of heating and cooling in use. The process, known as the Pyro-Plate process, has been developed by Todco, of Whitier, California.

Advantages Claimed

The results from processed moulds, which are quoted below, are based on the output produced by over 2,000 processed neck-rings over a period of more than eight months in the plant of a major American glass manufacturer as compared with unprocessed rings and it is planned to extend use of the process to other moulds. Some advantages are given as:—

(1) The life of processed moulds is extended between 75 and 85 per cent.; (2) a smoother, shinier finish is imparted to the glass by processed moulds; (3) the moulds, being stress relieved, are less subject to warpage in use; (4) the mould surface is easier to repair due to its non-oxidized nature; (5) the "plate" is metallurgically bonded to the mould surface and cannot lift or peel; (6) a hardening occurs which provides greatly improved abrasion resistance; (7) depth of the diffusion layer case, 0.003 to 0.005 in., allows the surface to be repolished and still retain its protective qualities; (8) surface dimensions of the mould as machined are not changed by the process, and (9) processing is relatively inexpensive.

Processing

Improperly-annealed cast irons are noted for warpage or dimensional changes when subjected to heat, even when machined. It is, therefore, essential that iron mould-castings be stress-relieved so far as possible by conventional heating methods before they are machined or processed with Pyro-Plate. Moulds are then processed in the following stages: Before processing, the surface of the moulds must be completely clean. (Oil and grease can easily be removed by vapour-phase degreasing or washing in aqueous cleaning solutions.) Scale, oxides, dirt and hard areas are best removed by vapour- or grit-blasting and the surface of the mould should be allowed to dry (if wet after cleaning). Then, to the clean mould surface, a thin layer of the proprietary nickel composition is applied, preferably by hand brushing with a fine camel hair brush. The paint may also be applied with the usual paint-spray gun, when thinned to proper consistency or, better still, with an air-brush for close work. The paint dries quickly.

When coating is dry, mating mould halves are wired together so as to ensure uniform heating and cooling, to minimize possible warpage. The moulds are next placed on trays of expanded metal and then heated.

In this operation, if warpage is expected, the moulds may first be preheated to approximately 200 to 250 deg. C. in the furnace. Next, moulds must be heated to a minimum of 900 deg. C. in the hot zone of the furnace. Higher temperature or holding moulds at 900 deg. C. will not adversely affect the "plating" but does increase the risk of warpage of the cast iron. A reducing atmosphere must be maintained in the furnace during the preheating, heating and cooling cycle. For a smooth, bright finish, hydrogen or dissociated ammonia are preferred for this purpose; deposits of carbon in the furnace should be avoided. Moulds should be allowed to cool to 315 deg. C. or below before removal from the furnace atmosphere so as to prevent oxidizing of uncoated areas.

After processing, the moulds will appear nickel coloured, with a frosty finish, and wire brushing will bring up a bright finish. Plated mould surfaces which subsequently become damaged, can be repaired in a conventional manner, using a fine welding-rod high in nickel content. The nickel deposit fused to and diffused into the processed mould surface prevents oxidation of the surface during welding and makes repair relatively easy, it is stated.

Technical College at Falkirk

On a nine-acre site at Grangemouth Road, Falkirk, a £1,000,000 technical college is being built which will provide courses on subjects ranging from chemistry and mechanical engineering to baking and confectionery.

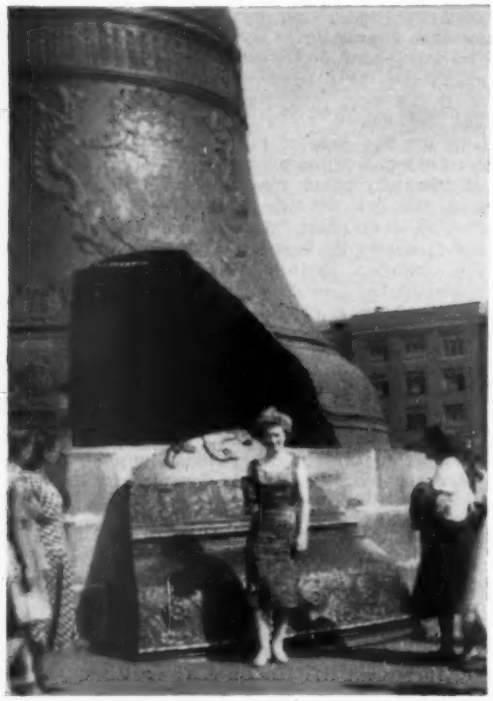
Its completion in two years' time, will signal the closure of four day-release and further education centres, including the Burnbank Foundry Trades Centre and the Falkirk Mining Institute; it will, however, open an era of day-release and further education in the Central Scotland industrial belt which will ensure a constant supply of fully-trained technical, trades, and commercial workers.

There will be 112,500 sq. ft. of floor space in the new College divided between workshops and classrooms. The main block will rise four storeys high. The assembly hall will seat 500 students and the dining hall a similar number in two sittings.

TWELVE TEAMS took part in the annual competition of the English Steel Corporation's ambulance class at the River Don Works last month.

Moscow Bell

The accompanying illustration, for which the JOURNAL is indebted to the editor of the *Stantonian*, shows the great Tsar Bell in the Kremlin in Moscow. The bell weighs 200 tons, but was never rung as it was broken during its installation. The picture was taken by the wife of Mr. Fred Wibberley of the cupola department of the Riddings Works. The bell stands 19-ft. high and has a circumference of 60 ft. The broken fragment weighs 11 tons.



Research on Heat-transfer

The American Foundrymen's Society Training and Research Institute of Golf and Wolf Roads, Des Plaines, Ill., has commissioned the Franklin Institute of Philadelphia to conduct original research in the field of heat-transfer. The basic aim will be to evaluate the heat flow from high-temperature molten metals as it occurs during the casting process. Findings of the study will be made available to the foundry industry.

The study will be undertaken in two basic steps: (1) to evolve an accurate, efficient method of simulating the dynamic behaviour of flowing, high-temperature molten metals, and (2) to use these simulation techniques to predict heat losses and falls in temperature which occur in the pouring phase of the casting process. The information also will become a useful tool for proposed future studies by the Institute on minimizing heat losses in casting. Research at the Franklin Institute will be under the technical direction of the heat transfer committee of the AFS.

Correspondence

To the Editor of the FOUNDRY TRADE JOURNAL.

FALSE JOINTS IN MOULDING PRACTICE

SIR,—I disagree entirely with "Tubal Cain" writing under the heading "False Joints in Moulding Practice" (FOUNDRY TRADE JOURNAL, November 24 issue), when he suggests that the split pulley should not be made as a three-parted job. I quote: "The solution to the problem posed by Fig. 2 is theoretically possible, but of doubtful value in practice," and again: "We don't usually have such boxes even in well-equipped foundries."

I say *most* founders would make the job as in Fig. 2, and if they had no shallow box-parts, these could soon be cast. I have made them this way, all depths; it is common foundry practice and most foundries (even small jobbing shops) have available "drags" or "middles" or "cheeks"—whatever you wish to call them.

Just to make sure that I was not alone in advocating this method of moulding, I have taken the trouble to enquire amongst my friends as to how they would make the same job. As yet, no one has told me he would make it differently from my method—which I should call the traditional way.

Let us have Tubal's ideas on this, please, just to set our minds at rest that industry still does some jobs in traditional manner, no matter what part of Britain we come from.—Yours, etc.,

JOHN R. W. WILLIAMS.

Bolton,
Lancs.

Cracking of Beta-brasses

The Institute of Metals has published a technical note from Dr. A. R. Bailey on the "Effect of Composition on the Intercrystalline Cracking of Sand-cast, Complex Beta-brasses under Constant Tensile Load," which ends with the following conclusions:—

The intercrystalline-cracking tendency of the 48-ton β material is intensified when the alloy contains the γ phase, but is inhibited when a small amount of α phase is present, although in the latter case the strength is lowered. The following practical conclusions may be drawn in respect of the extra alloying agents in cast materials.

Aluminium exercises the main strengthening effect, but aggravates the cracking tendency. As a ternary component aluminium is limited in amount to approximately 4 per cent., otherwise the γ phase is introduced into the structure. However, in the presence of either iron or manganese, of the order of 2 per cent., 5 per cent. or more aluminium can be added without γ formation. The introduction of manganese in this way does not give as good strength as 4 per cent. aluminium added alone, and there is no improvement in the cracking-resistance. In contrast, the presence of iron with 5 per cent. aluminium is beneficial to strength and cracking-resistance. The iron is probably most effective when manganese is also present, especially when the iron content is <2 per cent.

The addition of 2 per cent. nickel to the 48-ton alloy inhibits intercrystalline cracking. Nickel is effective only in the presence of iron, which can exceed 2 per cent. with advantage. Cobalt additions also improve cracking-resistance, but they encourage dezincification, with consequent weakening.

ALFRED HERBERT, LIMITED—Mr. D. W. A. H. Allen has joined the board.

Notes from the Branches

London

Well over 200 members and visitors attended the meeting of the London branch of the Institute of British Foundrymen held on November 16 at the Constitutional Club, London. The subject for the meeting was "CO_2 *versus* Other Methods," Mr. A. Talbot (of Western Foundries, Limited) giving his views on the advantages of the CO_2 Process and Mr. H. Haynes (retired) dealing particularly with those stemming from greensand moulding. Many interesting slides were shown by both lecturers, and the discussion which followed had to be curtailed owing to lack of time.

Discussion

The first question in the discussion after each protagonist had given a 25 min. address was directed to Mr. Talbot. He was asked why a zircon wash was not used instead of blacking, to which the reply was that this was to expensive; he regretted, however, that no one had yet found an adequate substitute for coal-dust. Another question related to costs for CO_2 *versus* greensand moulding. In answer, Mr. Talbot referred to a paper given in 1952 wherein it was claimed that moulding costs could be reduced by about one half if the CO_2 Process were adopted, and nowadays the binder was cheaper. Pressed for further elaboration, he agreed that silicate-bonded sand *per se* was more expensive than greensand, but held the view that other advantages substantially outweighed increased material cost. Asked how much new sand was used per ton of castings, the answer given was about 50 tons of sand for 75 tons of finished castings output, the speaker adding that it didn't pay to dry for re-use all sand reclaimed at the Hydroblast.

Mr. Haynes said in replies to questions that no founder could afford to take trial-and-error risks with really large castings and for these, well-established processes—such as the use of greensand for the 18-ton lathe beds he had described—were safest. As a Lancashire man, he took some pride in the fact that the CO_2 Process had been invented in Lancashire at the turn of the last century and had been well tried out in the county's foundries since. The result had been that it had only replaced traditional processes to a very limited extent.

Other questions and answers dealt with the need for better patternmaking when using the CO_2 Process, the economics which could result from using silicate-bonded sand as facing material only and the extra precautions which were needed to ensure adequate collapsibility of CO_2 Process moulds after casting. The concensus of opinion was expressed that greensand was still better for machine-moulding. A significant outcome of the attention founders had given to the CO_2 Process, it was agreed, was the much greater care now applied in the making of full patterns and core-boxes as compared with years ago, when a moulder often had to produce castings, usually by strickling, and employing primitive tackle. As a result, founders and patternmakers now enjoyed a much higher degree of co-operation which was of great benefit to the industry.

At the conclusion of the discussion, Mr. Haynes showed another series of slides of interesting castings produced in greensand moulds and briefly explained the way they had been made.

A vote of thanks was proposed by Mr. D. E. B. Barnard, seconded by Mr. J. P. Webster. Finally, Mr. Haynes said how pleasing it was to be so well received by such a large gathering of London-area members and Mr. Talbot explained that though they might differ in matters of choice of method, he had a great regard for Mr. Haynes and they had been friends for many years.

Tees-side

In view of the unqualified success of its seven previous apprentice competitions, the Tees-side branch is organizing a similar competition for 1960-61. As before, it will be open to any trade apprentice, or any other youth employed by a firm in the Tees-side area, who is under 21 years of age on December 31. There will be five sections to the competition—wood patternmaking, steelfounding, ironfounding, non-ferrous founding and a written-paper section. Apprentices will be asked to make a pattern or casting to instructions supplied, and it is proposed that all work should be done at the normal place of employment. Competitors may enter for as many sections as they wish but only one entry in each section is allowed. For each section there will be a first prize of £5 5s., a second prize of £3 3s., and a third of £1 1s. The entrance fee will be 5s. as before, and the Council hopes that this will be met by employers. Intending competitors should obtain entry forms from their departmental managers or foremen and return them to the IBF Apprentice Competition Secretary, Darlington Forge, Limited, Darlington, not later than January 31, 1961.

Northampton Section

With an attendance of 42 members and guests at the November meeting of the Northampton section, average attendance at the first four meetings of the current session totals over 40—a big step forward for the section. The aim has been to increase attendance by providing a programme carefully balanced to suit the needs of foundrymen in a district where membership from Morris Motors' Nuffield Foundry, Wellingborough, predominates.

Mr. B. Levy, lecturer at the November meeting on "Patternmaking Progress," stressed that it was very desirable for foundrymen to be able to read engineering drawings so that they could give to the patternmaker a clear idea of the type of equipment required. It was inevitable that when making a casting for the first time, it often had to be by trial and error, necessitating alterations to the equipment as the job progressed. This expensive way of working could be avoided to some extent, however, if the patternmaker could be given more definite instructions—for instance, where to part a job and whether to core-out or mould a certain section of a casting.

A patternshop draughtsman was looked upon as a great asset, because his interpretation of castings drawings in terms of detailed drawings for pattern equipment enabled the patternmakers to save time in planning and to use their skill to the best advantage. In his own firm, said Mr. Levy, much use was made of the latest types of machinery for increasing productivity; in this respect the copy-milling machine was an excellent tool and represented one of the greatest assets in the metal patternshop.

The lecturer illustrated his remarks with a number of slides and demonstrated a few examples of his own ideas applied to overcome well-known foundry problems. Noticeable amongst these was the fastening of pattern-lifting plates—designed for floor-moulding use—at the bottom of the pattern, with clearance holes through the pattern for eye-bolts. In this way there was no strain on the screws which held the lifting plates in position.

Notes from the Branches

In conclusion, Mr. Levy said his company also was associated with a production iron foundry and full advantage was taken of this to "prove" pattern equipment before delivery to a customer. Runner systems for multiple-pattern layouts were also proved on a trial basis by the foundry concerned before being fitted as a final system to the equipment.

Question time followed with Mr. Levy ably dealing with a variety of points put to him by members. A vote of thanks was then proposed by Mr. E. C. Rowen (president of the National Society of Master Patternmakers), and the proposal, seconded by Mr. G. W. B. Hanna, was received with acclamation.

Sheffield

Foundry textbooks seldom give sufficient details of a specialized subject and few technical papers adequately describe how a job can be done. The paper "Engineering the Re-layout of a Jobbing Coreshop" presented by Mr. A. Atherton to the December meeting of the Sheffield branch, was of exceptional merit in that the authors (the paper was written jointly by Mr. Atherton and his colleagues, Mr. W. H. Herring, chief engineer, and Mr. E. Roebuck, assistant engineer, of Samuel Osborn & Company, Limited, Sheffield), not only said what should be done but also gave a detailed account of what had actually been done to make a coreshop more efficient. Interesting comparisons given by the authors of cost of production of cores by the new and old methods showed that the re-organization had been very worth while. For instance, a typical valve-core costing 9s. 1½d. in the old coreshop cost only 1s. 11d. to produce in the re-designed shop.

Of particular interest were the results of a work-study on space utilization and sequencing of sand-mould production, core handling and internal transport which had pointed the way to many worthwhile improvements. Machine utilization and study of capacity rates also repaid detailed study. After showing slides outlining the effort/time characteristics of core-making machinery, the speaker concluded by stating that the improvements in the utilization of space allocated to coremaking had resulted in better working conditions for a smaller labour-force.

During question time, the authors were asked for further details on how to secure effective space utilization. Mr. Atherton made the point that passage-ways must be kept down to the minimum, as also must use of the floor for storage purposes. Floor space, he said, cost more money than was generally realized. Production must be organized to avoid making more cores than were actually needed, since cores not only cost money to store but usually deteriorated during storage. "Overhead" costs on the establishment were too high to-day, said Mr. Atherton, to permit accumulation of surplus stocks, and here he showed slides of space-saving shelves and stillages.

In answer to further questions, the lecturer said that a card requisitioning scheme was employed at his own firm and instructions were received from the production office. In this way, the coreshop usually got from two to five days' notice of the requirements of the foundry. The necessary cores, in mixed sizes, could then be delivered on stillages to that part of the foundry which required them.

In his vote of thanks, Dr. L. Harrison emphasized the practical nature of the paper and praised the authors and their firm for such a realistic approach to coreshop modernization. The changeover from the older, unsatisfactory methods had been achieved quickly and at minimum capital cost. Mr. F. Cousans seconded the vote of thanks, saying that it had been a very down-to-earth paper, of a type which was received well in the Sheffield area.

Census of Production Results

Results of the census of production for 1959, the first of a new series of simple annual inquiries following the detailed census taken for 1958, were recently published by the Board of Trade Journal. The new census collected information about only three items, the value of goods sold and work done, stocks and work in progress, and capital expenditure. It was based, not, as in the past, on the individual factory or workshop, but on a broader unit, usually a company or group of companies.

In metal manufacture (iron and steel) the results show a total fall during the year of £11,300,000, while work in progress also fell by £7,900,000. Stocks, however, rose by £1,700,000. The similar group for light metals, copper, brass, and other base metals showed a total increase of £6,200,000, work in progress was up by £4,000,000 and stocks also increased by £3,200,000. Mechanical engineering results also were good. The total rose by £4,800,000, with work in progress figures up by £6,300,000. Stocks, however, were down by £7,400,000. Electrical engineering showed a total increase of £57,500,000, work in progress was up by £24,500,000, with stocks increased by £6,500,000.

Capital expenditure figures (with adjusted figures for 1958 in parentheses) were as follow:—Metal manufacture (iron and steel), total, £111,700,000 (£128,200,000); new building, £14,800,000 (£18,000,000); mechanical engineering, total, £73,800,000 (£83,700,000); new building, £18,600,000 £23,300,000); electrical engineering, £56,700,000 (£55,300,000); new building, £16,100,000 (£17,100,000).

The estimates show that capital expenditure by manufacturing industries amounted to £855,000,000 in 1959, compared with £911,000,000 in 1958—a fall of 6 per cent. There were falls of 10 per cent. or more in the iron and steel, mechanical engineering, and the aircraft industry groups.

Sir John Cass Lectures, 1961

The Sir John Cass College, Jewry Street, Aldgate, London, E.C.3, announces the following series of lectures for 1961. The metallurgy department has a Monday evening course on liquid fuels, running from January 16 to June 12 starting at 6.15 p.m., the fee for which is £2. There are to be four lectures on trade marks by Mr. Anthony Walton, the first being on April 27 commencing at 6 p.m.; the cost for the full course being 10s. 0d. Mr. Walton is also taking an eight-lecture course on "Patents and Industrial Design." Details of these and other courses are available from the secretary of the College at the address quoted.

Mr. H. M. HURST is now joint managing director with Mr. FRANK A. HURST, chairman, of the Star Aluminium Company, Limited, of Wolverhampton and Bridgnorth. Deputy to the managing directors is Mr. W. K. ALTWEGG, special director and manager also in charge of sales. Two new special directors are Mr. KOLLER in charge of Bridgnorth factory, technical manager and deputy factories manager, and Mr. L. EVANS in charge of the activities of the Wolverhampton factories and production manager.

Stanton Employees receive Gold Awards

Four girls and three boys, all employees of the Stanton Ironworks Company Limited, received their Gold Standard Awards from H.R.H. The Duke of Edinburgh at Buckingham Palace on December 14. The recipients were Susan Butler of Ilkeston; Patricia Ford and Doreen Porteous of Long Eaton; and Anne Woodbridge, Ilkeston. The boys to receive awards were Tony Millinship and Geoffrey Oakes, both of Ilkeston; and James Anthony Pacey of Asfordby, who is employed at the company's Holwell Works. To qualify for their awards the girls undertook such tasks as farm work, rifle shooting, nursing, athletics and practical service in a local children's home. The boys have taken part in three- and four-day expeditions in the Peak District of Derbyshire and, in addition, had received first-aid instruction, during which they qualified for the "adult" certificate of the St. John Ambulance Association. This brings the total number of Gold Awards received by the young employees of the company to 24; six for girls and 18 for boys.

Greater Effort for Exports

Further warning that Britain must improve on recent export performances if she is to hold her place in world markets was given by Sir Robert Maclean, chairman of the Council of Scottish Chambers of Commerce, last week. "We who are concerned with business management," he said, "must not spare ourselves in overseas market research. Despite inconvenience, principals and directors must personally visit, and keep on visiting, overseas markets and customers."

He said that those concerned with the transport of goods must see that they were shipped on time and those employed at the docks could do more to help than they were doing. Restrictive practices — both labour and trade practices—should be examined and eliminated if not justified.

"We must become better designers and make our products look attractive—but with every regard paid to functional efficiency.

Latest Foundry Statistics

Steel Castings: The monthly statistics *Bulletin* published jointly by the Iron and Steel Board and the British Iron and Steel Federation records that the weekly average amount of steel melted for making alloy-steel castings during October was 2,640 tons, an increase on the weekly average output for the first 10 months of the year of 360 tons. For all types of steel castings, the October figure was 12,300 tons and this quantity made 6,400 tons of castings—a quite good figure even though provisional. The employment figure has also risen. On October 8 it stood at 18,680 showing an increase of 350 since September 10, and of 1,490 as compared with a year ago.

Copper-base Castings: The current *Bulletin* of the British Bureau of Non-Ferrous Metal Statistics reports that the production of copper-base castings during October was 7,602 tons, which is well above the monthly average for this year—7,289 tons—and exceeds the 1959 monthly average by 517 tons.

The impending retirement—on April 30, 1961—is announced of COL. S. C. GUILLAN for 50 years secretary of the Institute of Metals.

Parliamentary

Patents and Designs Bill

Moving the second reading of the Patents and Designs (Renewals, Extensions and Fees) Bill, MR. NIALL MACPHERSON, Parliamentary Secretary to the Board of Trade, explained that the Bill sought to amend two Acts passed in 1949—the Patents Act and the Registered Designs Act, both of which were consolidation measures. Amendments were necessary for three reasons. The first was to enable the UK to ratify the new text of the Industrial Property Convention on Patents, Designs, and Trade Marks, which was agreed at a diplomatic conference in Lisbon in 1958. The second was to amend the law regarding late applications for renewal of designs, so as to make it what all concerned seemed to have thought it was. The third reason was to enable higher fees to be charged for patents than the maximum permitted under the 1949 Act.

The change in the existing law necessitated by the Lisbon Convention related to the time allowed for the payment of renewal fees for registered patents and designs. The new text of the Convention demanded that the three months period of grace for payment of fees should be extended to six months in the case of both patents and designs. These extensions were provided for in the Bill.

The second reading was agreed, and the Bill was committed to a Committee of the whole House.

In a written reply to MR. AUSTEN ALBU (Lab.), MR. MACPHERSON stated that costs of the Patent Office had risen sharply, and it was estimated that in 1960-61 the costs properly chargeable to fees would be £1,686,000. Income from fees was estimated at £1,554,000, leaving a deficit of £132,000.

"Disservice" to Shipbuilding

Raising the subject of the shipbuilding industry in Scotland, MR. CYRIL BENCE (Lab.) expressed indignation about the leak of the report by the Department of Scientific and Industrial Research. He believed it his duty to express what he thought was the opinion of everyone in Scotland connected with shipbuilding—that a great disservice had been done to the industry by the DSIR report.

There had been a tremendous pace of modernization on the Clyde, but there was only one passenger liner being built, about 18 to 20 tankers, and four large ore-carriers. On the eastern side of Scotland there were no orders. This time next year the order-book, so far as could be seen at present, would show that only one-sixth of 1960 production would be put out. This would mean a tremendous drop in employment, and this prospect created serious fears about the situation towards the end of next year.

MR. JOHN HAY, Parliamentary Secretary to the Ministry of Transport, in the course of his reply, agreed that the situation on the Clyde was serious, but had not yet reached a point of great gravity. The industry was one in which prospects could brighten very rapidly, and one in which perhaps only two or three orders could make a great deal of difference if they were orders for big ships.

Mr. J. GREGORY, managing director of General Refractories, Limited, presented long-service awards to four employees at the Deepcar Works Sports Club annual dinner/dance at Stocksbridge, Sheffield, on December 10. Two had completed 45 years and two 25 years. Mrs. Gregory presented the Sports Club prizes.

News in Brief

THE telephone number of Turner Brothers Asbestos Company, Limited, 14, Finsbury Circus, London, E.C.2, has been changed to LONDON Wall 5471 (6 lines).

THE STEELWORKS of Hadfields, Limited, Sheffield, were visited by 40 members of the Sheffield branch of the National Trades Technical Society early this month.

PERMISSION HAS BEEN GRANTED by the Minister of Labour to two foundries in Willenhall (Staffs) to engage Italian foundry workers in order to help ease the labour shortage.

SANDVIK SWEDISH STEELS, LIMITED, of Halesowen, Birmingham, have opened a new distribution depot at Blackbraes Road, Nerston Industrial Area, East Kilbride, Glasgow.

IN VOLCLAY BENTONITE NEWSLETTER NO. 6, issued by the American Colloid Company, Skokie, Illinois, USA, the subject of mould erosion is covered and the causes—six all told—are listed.

A SYMPOSIUM on "Pressure-vessel Research towards Better Design," arranged by the Institution of Mechanical Engineers is to be held at 1, Birdcage Walk, London, S.W.1, on January 18 and 19.

THE SECOND OF A FLEET of 11 river icebreakers has been launched at the Balatonfüred Shipyard, on the northern shore of Lake Balaton, Hungary. Fitting should be completed by the end of the year.

WHAT IS CLAIMED to be the largest steelworks crane in Europe (75-ft. span and 475 tons capacity) has been ordered for the Bremen works of Klockner-Hütte from Maschinenfabrik Augsburg-Nurnberg AG.

THE *Verein Deutscher Giessereifachleute* (the German foundrymen's institute) has presented the Verein Deutscher Eisenhuttenleute with a bronze plaque to mark the centenary of the German iron and steelworks association.

WILSON & LONGBOTTOM, LIMITED, loom manufacturers, of Barnsley, Yorkshire, because of increased output following a link-up with a leading American loom company, have acquired land at Barnsley to permit of extensions to their works.

HUGH SMITH & COMPANY (POSSIL), LIMITED, hydraulic engineers and heavy machine-tool makers, have changed their name to Hugh Smith (Glasgow), Limited. There is no change in the constitution or control of the company, and the directorate remains unaltered.

INCANDESCENT HEAT COMPANY, LIMITED, Cornwall Road, Smethwick, Birmingham, has issued as Reprint 51 a paper on "Refractory Suspended Construction" which Mr. W. S. Sinclair presented to a joint meeting of the Society of Furnace Builders and Society of Glass Technology.

FIRST PLANT in Scotland for cleaning components for nuclear reactors has been brought into operation by M. Cockburn, Limited, Glasgow. The £20,000 plant operates in an airtight, dust-proof, room and will be used for cleaning other companies' products as well as those of Cockburn.

THE MOTOR VESSEL Karamea (11,006 tons), recently sold by Shaw Savill & Albion Company, Limited, London, to the British Iron & Steel Corporation, has arrived at Inverkeithing, on the Forth, to be broken up by Thomas W. Ward, Limited. The vessel was built on the Clyde in 1928.

JESSOP-SAVILLE, LIMITED, are now issuing safety posters produced in Urdu and Arabic to provide guidance for its Asiatic workers. Mr. Cyril Slinn, the firm's safety and welfare officer, introduced the scheme, and the translation is done by a Pakistani rolling-mill hand at the firm.

PRESENTATIONS of clocks have been made to 851 employees of the Coventry firm of machine-tool manufacturers, Alfred Herbert, Limited, who have 35 years or more service with the company. Among the recipients were nine directors whose service ranged from 25 years to more than 50 years.

Mr. G. R. PRYOR, chairman of Edward Pryor & Son, Limited, marking devices, Broom Street, Sheffield, presented gold watches to four employees to mark their admission to the "21 Club" of those who have completed 21 years' service with the firm, at the club's annual dinner at the Kenwood Hall, Sheffield, on December 6.

METROPOLITAN-VICKERS-BEYER PEACOCK, LIMITED, are to close their railway locomotive works at Stockton next February. The 342 employees were informed of the decision when they reported for work on December 5. It was explained that the management would co-operate with any other engineering firm which may want to take over the factory.

BAKER PERKINS, LIMITED, of Peterborough, have purchased their own aircraft. It has been based at Westwood airfield, which adjoins the company's offices and works, and will be used to fly executives and others direct from there to subsidiary factories and to business engagements in the British Isles and on the Continent. If the need arises it will fly urgent spares to customers' factories.

AN HOUR'S WALK-OUT, staged by foundry operatives at the factory at Wellingborough, Northants, of the Morris Motors branch of the British Motor Corporation, Limited, to protest against the employment of sub-contractors while there is a recession in the motor industry, has been followed by a decision to carry on work as usual to allow time for the management to bring more work into the Corporation's foundries.

THE FOLLOWING SHEFFIELD DISTRICT STEEL FIRMS are in the "Top Twenty" in the country with the lowest accident rate during part of this year:—Daniel Doncaster & Sons, Limited; Arthur Lee & Sons, Limited; Arthur Lee & Sons (Cold Strip), Limited; Kayser Ellison & Company, Limited; Sheepbridge Company, Limited, near Chesterfield; Appleby-Frodingham Steel Company, and Thomas & Baldwins, Limited, both of Scunthorpe.

A RE-EQUIPMENT PROGRAMME for the Cargo Fleet Works of the South Durham and Steel and Iron Company, Limited, to cost approximately £2,700,000, entails replacement of existing coke ovens by a complete coke-oven installation. The contract, placed with Gibbons Bros., Limited, engineers, comprises 60 ovens, coal- and coke-handling and by-product manufacturing plant. Work on the new plant has commenced and completion is scheduled for the end of 1962.

LAST YEAR £172,002 was paid out by 122 firms for suggestions from personnel, many of them in Birmingham factories. The highest award in the country was £1,100 made to Mr. D. Clarke, a bench tool fitter employed by Joseph Lucas, Limited. A survey carried out by the Industrial Welfare Society states that Birmingham works were active participants in the scheme and in the Lucas organization as a whole £36,000 was paid in award money to 7,000 people.

BARROW STEEL WORKS, LIMITED, have presented a 40-ton steam locomotive to the Stone Cross Special School, Ulverston, which has 94 boy boarders. The engine, in working order and about 100 years old, has been fixed permanently on rails on a concrete bed which the boys helped to prepare. A similar engine has been delivered to await the arrival of children at Drumard House, Barrow, a training centre for backward children which is due to open this month.

THE ROYAL INSTITUTION OF NAVAL ARCHITECTS, the Institution of Engineers and Shipbuilders in Scotland, and the North East Coast Institution of Engineers and Shipbuilders have agreed to co-operate with the Institute of Welding in a joint symposium on welding in shipbuilding to be held in London in October/November, 1961. Details may be obtained from the secretary, Joint Symposium Committee, Institute of Welding, 54, Princes Gate, Exhibition Road, London, S.W.7.

SIR PERCY HUNTING, chairman of the Hunting group of companies, is to deliver the 1961 Lord Semphill Paper on "The World's Future Transport Requirements" at a meeting of the Institution of Production Engineers on January 25 in the Lecture Theatre of the Royal Aeronautical Society, 4, Hamilton Place, London, W.1. The meeting commences at 6.30 p.m. Admission is by ticket only and application should be made to the secretary of the Institution at 10, Chesterfield Street, Mayfair, London, W.1.

INDUSTRIAL MANAGEMENT was discussed by members of the Nottinghamshire and Derby branch of the Institution of Works Managers in the first of a series of students' forums at the County Hotel, Nottingham, on December 9. On a panel were Mr. R. H. James, personnel manager for Raleigh Industries, Limited, Mr. V. G. Page, personnel manager, Boots, Limited, and Mr. E. Wilkinson, senior lecturer in management at Nottingham Technical College. Certificates were presented to successful students who had completed last year's course in works management at Nottingham Technical College.

THE SHROPSHIRE SECTION of the Institute of Industrial Supervisors has been awarded the Mansell Trophy in competition with some 60 other branches of the Institute throughout the country. The awards is made to the section in recognition of the high standard achieved in all phases of its work. The president of the section is Mr. G. B. Sankey, assistant managing director of Joseph Sankey & Sons, Limited, and the vice-presidents are Mr. J. R. Martin, director and general manager of Sankeys at Wellington, and Mr. K. W. Leach, managing director of Audley Engineering Company, Limited.

PERKINS ENGINES, LIMITED, of Peterborough, have secured orders totalling more than £1,000,000 from West Germany for about 7,000 engines of different types. The orders received from the German combine-harvester manufacturer, Gebruder Claas Maschinenfabrik, of Harsewinkel, West Germany, include a substantial item for the new Perkins Six 354 agricultural diesel-engine which made its début at the Smithfield Show. Perkins first supplied diesel engines to Claas in 1953, in face of strong German and foreign competition, and since then the company estimates it has supplied at least 40,000 engines to West Germany.

MEMBERS OF THE AMBULANCE SOCIETY at the steelworks of Hadfields, Limited, Sheffield, are to be issued with badges for easy identification when their help is needed, said Dr. J. Gregory, medical officer, at the Society's 52nd annual dinner on December 3. He added that although people seemed less keen on volunteering for first-aid work, he was not so concerned with a large paper membership as in having people who were really interested in the work. According to Mr. E. V. Staines, Sheffield Chief Constable, the official foundation of the Society was in 1900, but it has been in operation much longer and is probably 100 years old. Lord Dudley Gordon, chairman of the company, presented awards to members of the society.

ALUMINIUMWERKE NÜRNBERG G.M.B.H., of Nuremberg, entirely owned by Aluminium, Limited (Alcan), of Toronto, expects a 10 per cent. rise in its 1960 turnover. The company employs 1,300 people and its principal customers are automobile manufacturers. The Nuremberg comany and its subsidiary at Goettingen, Lower Saxony, with about 1,350 workers, envisage that the increasing demand for aluminium products will mean a further turnover increase in the future. According to a company spokesman, the growing plastics industry is not regarded as a serious competitor. The two German Alcan companies had a turnover of $14,400,000 last year, amounting to a 4 per cent. share in the German market. Their total capacity is 10,000 tons a year.

A NEW COMPANY, Head, Wrightson India, Limited, has been formed as a wholly-owned subsidiary of the present company at Thornaby-on-Tees to handle the group's expanding Indian interests. It will act as contracting company for the supply, as far as possible from Indian sources, of various types of plant to the design of the parent company. It is hoped to incorporate a rupee company within the next three years. The chairman of the new company will be Mr. Peter Wrightson, vice-chairman of Head, Wrightson & Company, Limited, and Mr. Vaughan Pendred will be managing director. Head, Wrightson & Company, Limited, is supplying all the ironmaking plant and much of the ancillary equipment for the Durgapur steelworks project.

THE FEDERATION OF BRITISH INDUSTRIES is sending a delegation to Nigeria in January, 1961, to take part in a Nigerian Industrial Development Conference. The delegation, which is expected to leave for Lagos on January 12 and to return on January 31, is to be led by Sir Norman Kipping, director-general of the FBI. The Rt. Hon. Frederick Erroll, M.P., Minister of State, Board of Trade, who will be visiting Nigeria at that time, will attend meetings of the conference. While in Nigeria, parts of the delegation will tour each of the three Regions, after which the conference itself will take place in Nigeria.

A NEW FACTORY, built by Dansk Automobil Byggeri A/S, Denmark, an associate company of Leyland Motors, Limited, Leyland (Lancs), for servicing Leyland, Albion, and Scammel vehicles, was opened on December 6, just outside Silkeborg on the Jutland Peninsula. The opening ceremony was performed jointly by Sir Henry Spurrier, chairman and managing director of Leyland's and Mr. Julius Bomholt, Danish Minister of Labour and Social Affairs. Total floor area of the factory is 80,000 sq. ft. Accommodation for 20 vehicles, most of it with inspection pits, is provided in the 300-ft. long by 110-ft. wide main building, each of the vehicle sections having its own direct entrance from outside and a sliding door enclosing each one. Heavy units and parts will be stored in a 20,000 sq. ft. basement and engine overhaul and production of spare parts will be carried out in a special machine shop at normal floor level. The factory also has an extensive stores department adjoining the administrative offices.

Company News

Colvilles' Profit Jump

Higher profit and dividend payment for the year ended September 30, 1960, are announced by Colvilles, Limited, iron and steel manufacturers, of Glasgow. A final dividend of 10 per cent. makes a total of 16 (14) per cent. on a capital increased by debenture conversions. Consolidated net profits and other income, after depreciation and taxation charges, amounted to £5,707,928 compared with £3,675,091 in 1959-60.

Output of pig-iron is a record in the history of the company, the directors state. The demand for all classes of steel continued strong in the second half of the year and capacity was fully employed. New orders are not now coming in so fast, but the orders on hand will keep the plant fully employed for some months. Group output was: Coke 698,067 (468,132) tons, pig-iron 963,586 (673,163) tons, steel ingots and castings 2,056,467 (1,442,312) tons.

The new billet mill at Hallside works was brought into commission during the year and gives every indication of being a useful unit, it is stated. Progress in the construction of the strip-mill development scheme is being well maintained. Expenditure during the year on all schemes totalled £16,614,174, which the company financed from its internal resources without calling on the loan arranged with the Government.

HICK, HARGREAVES & COMPANY, LIMITED—Interim dividend for 1960-61 is raised to 5 (4) per cent.

GEORGE COHEN 600 GROUP, LIMITED—Of the rights issue of 5,000,000 5s. ordinary shares at 12s. a share, ordinary stockholders have accepted a total of 2,286,680 shares. This means that 54.26 per cent. of the issue to raise about £3,000,000 is to be taken up by the underwriters.

MASSER-WATERFORD IRONFOUNDERS, LIMITED, Dublin—Group net profit for the year ended June 30, 1960, was £23,040 (£47,827), after tax. The outlook is better than at the same time last year and the chairman, Mr. A. H. Masser, is confident that the current year's figures will show an improvement.

BRIGHTSIDE ENGINEERING HOLDINGS, LIMITED—Final of 15 per cent. is being paid, against the minimum of 12½ per cent. forecast at the time of the acquisition of Graham Firth Steel Products, Limited, earlier this year. This raises the total from 17½ to 20 per cent. for the year to September 30, 1960. After tax of £532,269 (£424,787), and excluding pre-acquisition profits, the group net surplus increased from £418,136 to £528,844.

THOMAS BLACKBURN & SONS, LIMITED—Reconstruction has been practically completed and the company was trading at a net profit for the latter part of the year ended June 30, 1960. Mr. C. C. Miller, the chairman, says the financial position has considerably improved and this trend is continuing. During the year the moratorium creditors were paid off in full within the moratorium period and the overdraft was reduced from £218,010 to £35,994.

NEEPSEND STEEL & TOOL CORPORATION, LIMITED—Sir Stuart Goodwin, president, said at the annual meeting that at the time his report was prepared, things were difficult. Now the future could be seen more clearly and despite the recession in the car industry, order-books were full. Production costs must be kept as low as possible, but he would be "terribly disappointed" if the company was not in as happy a position at the next annual meeting as it was now.

Personal

Sir THOMAS OVERY has vacated his office as a director of Powell Duffryn, Limited.

Mr. WILLIAM A. DEVON has been appointed to the board of Venner, Limited, as from January 1.

Mr. E. H. N. BREEZE has been appointed commercial manager of Lucas Industrial Equipment, Limited.

Mr. O. H. SMITH, Mr. F. KAYE and Mr. W. GETHING have been appointed directors of Hepworth Iron Company, Limited.

Mr. G. R. WHITEHEAD, general manager, has been appointed a director of the Wolsingham Steel Company, Limited, Co. Durham.

Mr. B. M. LEE has been appointed manager of the industrial group of Belling & Lee, Limited, electronic component manufacturers, of Enfield, Middlesex.

Mr. V. C. PRICE has been appointed managing director of Sandvik Steel Band Conveyors, Limited, in succession to Mr. ERNEST BEALING, who will remain on the board.

Mr. R. S. BEALE, a director of L. Sterne & Company, Limited, Crown Iron Works, Glasgow, has been appointed a director of Grampian Holdings, Limited, the Glasgow investment company.

Mr. F. CARRUTHERS, industrial relations officer for the East and West Ridings Region of the Ministry of Labour for six years, has retired from the post. He has been with the Ministry since 1921.

Mr. H. V. ROWLANDS has been appointed sales director for Burtonwood Engineering Company, Limited, Warrington (Lancs). Burtonwood Engineering was acquired in October last year by U.S. Industries Inc. (Great Britain).

Dr. J. M. HOLM, a joint managing director of the Nobel division of Imperial Chemical Industries, Limited, has been appointed to succeed Dr. JAMES CRAIK as chairman of that division when Dr. Craik retires on March 31 next year.

Chairman and managing director for many years of the Doncaster brassfounding firm of Peglers, Limited, Mr. F. BIRCHALL recently celebrated his 90th birthday at his home in Harrogate. He retired from active service with the company at the age of 77.

Mr. JOHN HUNTLEY, chairman of Sir William Arroll & Company, Limited, Glasgow, is retiring at the end of the year after 50 years' service with the company. The opportunity is to be taken to present him with a gift from the employees of the company at Parkhead Crane Works.

To mark his retirement from the chairmanship of Jessop Saville's sports club after 28 years, Mr. D. W. HAMMOND has been presented with a canteen of cutlery and an album of photographs by Mr. R. P. Wallace, managing director of the company and president of the club.

Major General E. H. CLAYTON, a director and general manager of B.M.C. Service, Limited, has been appointed to the board of Morris Motors, Limited. He has been a local director since 1955. Mr. PETER N. DAVIES, manager of B.M.C. parts division, has been appointed a director of B.M.C. Service.

Mr. M. SEAMAN, M.SC., has been appointed head of the Department of Industrial Engineering at Loughborough College of Technology, Loughborough. He will still continue his consulting practice in industrial engineering and management as senior partner of Associated Technical Consultants.

Book Reviews

Patternmaker's Manual. Published by American Foundrymen's Society, and obtainable from the Penton Publishing Company, Limited, 2, Caxton Street, Westminster, London, S.W.1. Price $9.50 (£3 14s. 6d.) (for members of the American Foundrymen's Society $6.50 (£2 15s.) both prices post free.

Until the ninth chapter had been reached the reviewer found this book rather "the same old story" and was beginning to conclude that it was expecting too much to hope for something really fresh in patternmaking literature after the many previous publications he had reviewed on the subject.

Earlier, the main differences most noticeable in this present book had been in terminology and the use of American words such as "lumber" in place of the British term "timber," "skree" in place of "strickle," etc. Then came the chapter dealing with elementary moulding which also contained a description of an ingenious pattern arrangement for moulding a greensand cored groove in a sheave-wheel, and from then onwards—through a total of 25 chapters—came a galaxy of information on planning and design of practically all classes of pattern equipment, from core dryers to permanent moulds. Undoubtedly this publication is a necessity to every progressive patternmaker and represents a very good "buy" for every foundryman, too! Apprentices and students will find many explanations of matters puzzling to those new to the foundry industry—and probably at times also to more-experienced operators.

One might comment (with a constructive intention) that a number of the photographic illustrations could do with sharpening to make them much more informative, and that judicious elimination of certain duplicated statements would give the book additional crispness.

As it is, the manual obviously represents a collation of the "know-how" of many experts. It will make a valuable addition to the workshop bookshelf, where without doubt it will not remain long unused, particularly in progressive patternshops.

B. LEVY.

Twelve Lessons on Foundry Mechanization (in Italian), by Guglielmo Somigli. Published by the *Associazione Italiana di Metallurgia* (Centro Fonderia), 16, Via Moscova, Milan; price on application.

This book is a reprint of articles which were, it is thought, serialized in *Fonderia Italiana*, the Italian foundry journal. In the opening paragraph, the problem of mechanization is well set out and stated as:—"To produce a ton of castings, 100 tons of various raw materials must be handled," and this figure is carefully analysed and broken down.

The second article covers the making of moulds by machines, covering such questions as patternplates, snap and slip flasks and kindred subjects. This is followed by one on moulding machines and includes descriptions of simple stripping apparatus, machines using hydraulic power and compressed-air, and those involving combinations of press, squeeze, vibration and draw. Finally, the Sandslinger and Sandrammer are dealt with.

The fourth lesson covers sand preparation and the plant used for this purpose and includes sections on drying, sieving, mixing and projection (Royer) plant. Next, the author deals with the sand distribution and, using clear drawings, shows a number of layouts. He covers various types of mould hopper and over-machine distribution.

The sixth lesson has for its subject moulding systems and special casting methods. Amongst the former is included stack moulding and the latter centrifugal casting, which is dealt with quite extensively. Die-casting, but not of ferrous metal, is dealt with briefly, but shell moulding receives somewhat more detailed study. Melting furnaces are dealt with in lesson seven, where the mechanical handling of the charges, from the rail or road wagon to production of the liquid metal comes in for consideration, and includes surveys of both hot- and cold-blast cupolas. In the following chapter, the means of taking the metal to the mould and the construction of mould conveyors are fully covered. After this, the author treats the subjects of knocking out, cleaning and fettling by various means including shotblasting. Next, he discourses on the general subject of mechanization for small, medium and large foundries, illustrating by simple diagrams. In the penultimate lesson, an example of a layout for the working of a mechanized foundry is detailed and finally, a second example is given of the scheme adopted by a huge concern.

The book runs to 111 pages and is well illustrated. Dr. Somigli has undoubtedly made a useful and interesting contribution to a distinctly difficult subject.

V. C. FAULKNER.

Machining of Steel, by F. C. Lea and Eric N. Simons. Published by Odhams Press, Limited, 96, Long Acre, London, W.C.2; price 21s. 10d. post free.

The book deals descriptively with the basic machining processes of turning, spacing, drilling, milling, broaching, reaming and sawing. Simple explanations are given of the design and operation of the various types of machine-tools used for these processes together with some excellent drawings of these machines and the tools used.

The standard of treatment is suitable for apprentices, trainees and others requiring an introduction to this important branch of technology. The book would form an excellent text for students preparing for the City and Guilds of London Institute examination in machine-shop engineering. In addition to the section on the cutting processes there is a chapter dealing successfully with the difficult subject of compound and differential indexing. There are brief references to jigs, fixtures and gauges.

The grinding process is not dealt with, for the reason given in the book that a companion book has been published by one of the authors on this subject, "The Grinding of Steel," by Eric N. Simons. Another omission is the cutting of screw threads using taps and dies.

The treatment of cutting tools is very sound and contains much of interest to the expert as well as to the type of reader for which this book was designed, but some criticism can be made of the scant treatment of sintered-carbide and ceramic tools. Also, in the chapter on milling, the method of face milling for machining flat surfaces is not emphasized as it should be, considering that this is the most widely used method in production shops at the present day.

Machinability, as affected by tool material and geometry, feeds and speeds, work material and its condition, is covered very well. The action of cutting fluids is described and useful information given on selection of the most suitable fluid for a given operation. The book ends with two appendices dealing with the special problem of machining work-hardening manganese-steel, and an outline of the electro-spark method of machining metals.

J. W. K. MURCH.

Publications Received

Fire Research Special Report No. 3. Published for the Department of Scientific and Industrial Research by Her Majesty's Stationery Office, York House, Kingsway, London, W.C.2; price 3s. 4d. post free.

Recommendations on the design and use of protective clothing for aircraft-crash workers, discussed in this report, are based on laboratory tests devised and carried out by the Joint Fire Research Organization to assess the protection afforded against flames and heat by many types of clothing. The recommendations are also applicable to protective clothing for people in industries involving high-temperature processes.

The report analyses conditions of air temperature and radiant heat which may be encountered, and continues by discussing the effect of heat on the human body and the limits of tolerance. Finally, the ways in which suitable protective clothing can give protection against differing conditions of air temperature and radiant heat are dealt with. Notes are also given on special requirements for protection for the head, hands and feet.

Vitreous Enamels. Published by Borax Consolidated, Limited, Carlisle Place, London, S.W.1.

This extremely interesting and useful publication on vitreous enamels, carries six chapters and three appendices, one of which gives a selection of enamel-frit batch recipes for the commoner applications. The opening chapter tells of basic raw-materials used, the method of manufacturing frits, milling of the enamel and its control. The second chapter deals with types of metal stock on to which the enamel is applied, including cast iron and sheet iron, and a section on acid pickling is incorporated. Excellent descriptions of both "wet" and "dry" enamelling processes are given in chapter three. This is followed by a chapter on enamelling defects—of which 13 types are dealt with—and hints are given for their elimination. A long chapter is devoted to enamel-frit properties and compositions, and this is probably the most valuable section of the book. Finally, modern developments in frit production are outlined.

Yearbook and List of Members 1960/61. Published by the Institution of Metallurgists, 4, Grosvenor Gardens, London, S.W.1.

Apart from giving a list of members, this yearbook of the Institution of Metallurgists contains a biography of the president, Mr. W. E. Badgett, B.SC., F.I.M.; there is a section on the foundation and objectives of the Institution; and lists of officers and committee members of kindred associations and of colleges providing metallurgical courses. In addition, details are given of the regulations for admission to the various grades of membership of the Institution, examination fees payable, annual subscriptions and, finally, examination syllabuses.

Overseas Trainees in United Kingdom Industry. Published by the Federation of British Industries, 21, Tothill Street, London, S.W.1; price 6d.

As a general rule companies in the UK can render no better service to British industry than to undertake the training of an individual from overseas (in particular from the Commonwealth), because it often happens that the trainee becomes biased in favour of the products of the country where he receives part of his education. Whilst the Federation of British Industries is taking a leading part in this activity, a number of semi-Governmental agencies are also concerned, and the names of these bodies are given in an Appendix of the booklet under review. Potential employers of trainees from overseas will find in the booklet essential information on every aspect of the subject, including sponsorship, where needed, possible payment for production work, language difficulties, insurance, welfare and kindred subjects.

FBI Register of British Manufacturers—1961. 33rd Edition. Published November 1960 for the Federation of British Industries by Kelly's Directories, Limited and Iliffe & Sons, Limited, Dorset House, Stamford Street, London, S.E.1. 50s. post free.

This issue of the "FBI Register" contains lists of the products and services of nearly 8,000 member firms under more than 5,400 alphabetical headings.

In addition to the Classified Buyers' Guide there are seven other sections in the Register, giving addresses of companies and firms, and information about trade associations, proprietary names, trade marks, etc. The French, German and Spanish glossaries give translations of every product term used in the main buyers' guide, each being numbered for easy reference between the English headings and their translations.

Botting Clays for Cupola Tapholes. Issued as Broadsheet No. 3 by the British Cast Iron Research Association, Alvechurch, Birmingham.

Quite serious defects in castings can arise in foundry practice due to mistakes in the process of botting-up a cupola. In the *Broadsheet* under review, simple instructions are given for rationalizing the process which, if followed, should eliminate trouble. (These *Broadsheets* represent an excellent service by the British Cast Iron Research Association to the ironfoundry industry.)

New Catalogues

Plant for Gas Handling. In leaflet No. V59(2), the gas atmospheres division of the Incandescent Heat Company, Limited, Cornwall Road, Smethwick, Birmingham, describe the plant they make for gas handling, processing, and control.

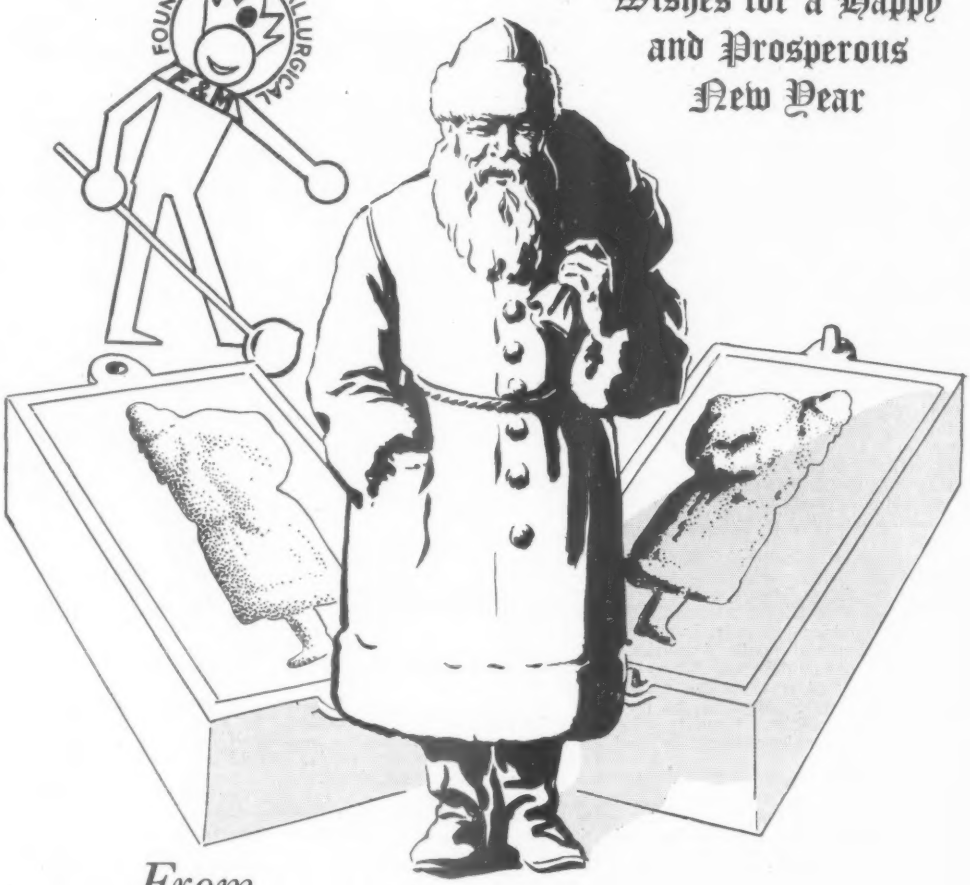
Machinable Refractories. W. & C. Spicer, Limited, The Grange, Kingham, Oxon, have issued a four-page leaflet covering zirconite, a high-grade refractory withstanding up to 1,500 deg., which, as supplied, is machinable at slow speeds. Details of castable zirconite cement are also given in this publication.

Electric Tube Furnace: Leaflet TD23, received from the Morgan Crucible Company, Limited, Battersea Church Road, London, S.W.11, is printed in English, French and German, and discloses a system under which firms can build their own tube furnace from instructions and materials supplied from Battersea.

Hand Tools. Many of the tools listed in Catalogue No. 26 (4th edition), issued by Stanley Works (Great Britain), Limited, Rutland Road, Sheffield, 3, are of interest to patternmakers. The catalogue gives details of a variety of planes, shapers, bit braces, hammers, but the major appeal is to the "do it yourself" handyman.

To all our Friends—

Seasonal Greetings and Best Wishes for a Happy and Prosperous New Year



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Raw Material Markets

Iron and Steel

Current production of pig-iron maintains the recent high level. From the 85 furnaces now in blast an annual average output of about 16,000,000 tons is being obtained. Basic steelmaking pig-iron comprises the major portion, over 80 per cent. of present output being obtained in this grade, and the steelworks are also using a large proportion of current outputs of hematite pig-iron, substantial quantities of which are used in the production of steel, ingot moulds, and other castings.

The blast furnaces continue to produce adequate quantities of all the irons used by the ironfounders and are able to meet present demands satisfactorily. For some brands, particularly high phosphorus irons, output exceeds demand and producers are unable to dispose fully of surplus tonnages, apart from those which they hold in stock. Some relief is afforded by overseas buyers, but more iron is available for dispatch to foreign customers as and when orders can be secured against the strong competition from continental producers. The foundries are obtaining the required supplies of low phosphorus irons and although the recession in the motor car industry has eased the demand for this grade of iron, substantial tonnages continue to be taken up for the production of high quality castings.

Overall, the engineering and speciality foundries maintain good outputs of castings. Those supplying mainly to the motor car trade continue to be affected by the reduction in demand. Some units are working a four-day week, but this can only be continued if more work can be obtained from other trades. The machine-tool industry continues to specify freely for castings, and the heavy engineering, electrical, and power plant manufacturers as well as the steelworks are using substantial quantities.

Light foundries making castings for domestic appliances are still in the doldrums, as only moderate demands are being made upon them. The building trades maintain a demand which provides the light foundries involved with a reasonable amount of work, but light foundries generally, in common with many of the jobbing and textile foundries, have capacity to spare. Most foundries are able to obtain reasonably good quantities of scrap in the grades required, but supplies are none too plentiful and there is a shortage of the special qualities. Foundry coke deliveries are satisfactory and ganister, limestone, and firebricks are in good supply.

The re-rollers continue to be well occupied and although the demand for some products is not now so heavy, they have sufficient work on hand to enable them to obtain good outputs for some time ahead. There is a good demand for small bars and light sections, and reinforcing bars are in heavy request. The call for bright drawn bars and hot rolled strip has eased slightly. Most of the re-rollers are well provided with mild steel semis, but special qualities and carbon steels are still scarce and suitable re-rolling defectives and crops from the steelworks are accepted.

Non-ferrous Metals

Continued dullness in copper on the London Metal Exchange is attributed to the unfavourable receipt of the November figures of the US Copper Institute. These showed a drop in output of crude and refined copper in the US, but increased output outside the States. Compared with October, crude copper was down to 110,816 (112,665) tons and refined copper, 149,277 (151,497) tons. Domestic deliveries, however, rose to 99,749 (93,451) tons; and end-month stocks of refined copper to 130,254 (113,417) tons.

US market prices of the common stocks of the leading copper producers are about 35 per cent. below their 1959 peaks and nearly 45 per cent. below the 1956 peak.

Some earlier activity in tin was not maintained and the market remains fairly steady. There is some likelihood that production at the Manono mine in Katanga may be resumed in the New Year after having been idle, owing to the national disturbances, since mid-September. No information is obtainable regarding operations at the company's electrolytic tin smelter at Manono which produced about 7,000 tons of tin a year.

A categorical denial has been issued by the Indonesian Government that it has any knowledge of substantial quantities of tin metal in Indonesia being offered by persons claiming to have official authority. The International Tin Council has been informed that some tin metal in Indonesia might be in private hands, but the quantity involved would be very small.

The somewhat gloomy aspect of the lead market has not been improved by the reduction of 1 cent per pound in the US domestic price, the general expectation being that the price of 12 cents would be held at least until the end of the year. Presumably the drop in the London quotation tot he lowest level since the war was partly responsible as the gap between the two markets had become unduly wide, even allowing for the import duty and the insulating effect of the quotas.

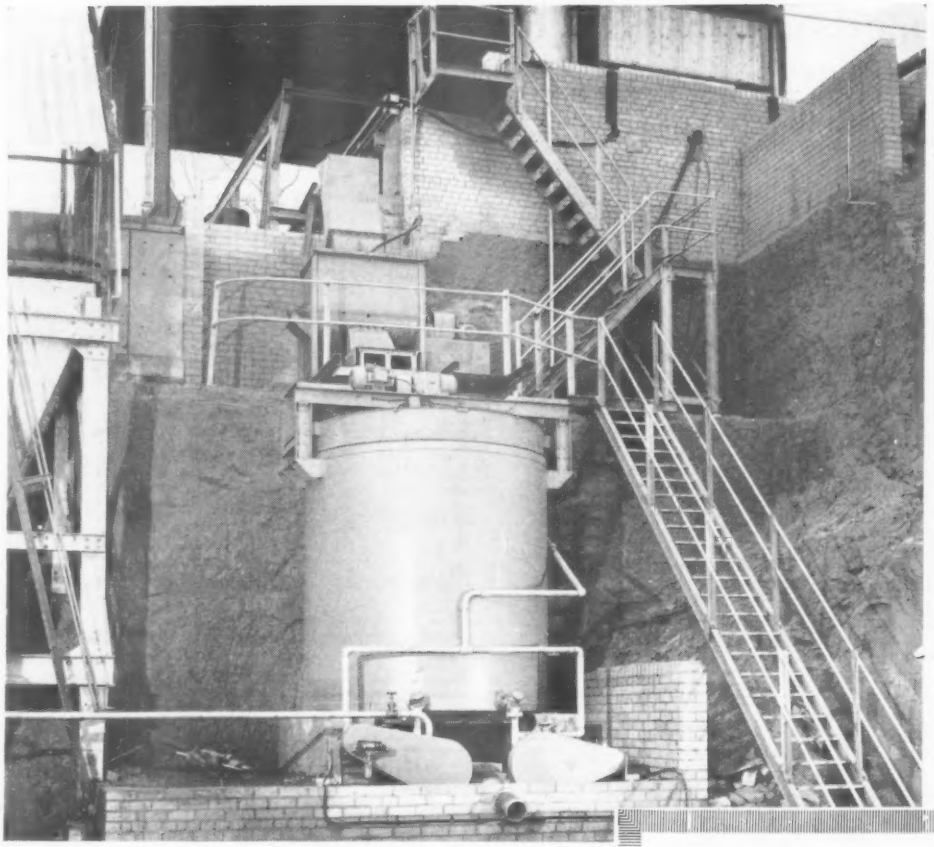
Zinc is an easier market. The US reduction in price from 13 to 12.50 cents per pound accentuated the downward trend in London. Consumer demand kept up fairly well, but has slowed down this week. The overall supply position of the metal seems fully adequate for the time being.

Reorganization Scheme for ICI Board

Coming into effect on January 1, is a scheme of organization involving a redistribution of responsibilities among the executive directors of Imperial Chemical Industries, Limited. Following the retirement last March of the economic planning director, Mr. J. L. S. Steel, the company has discontinued economic planning. By combining research and development the number of functions has been reduced from eight to six. An additional overseas director has been appointed.

The functional directors will be: Commercial, Mr. W. D. Scott; finance, Mr. P. T. Menzies; overseas, western hemisphere and Africa south of 15 deg. of north latitude, Mr. R. C. Todhunter; Europe, excluding Russia and eastern Europe, Dr. A. Caress; rest of the world, Dr. J. S. Gourlay; personnel, Mr. C. M. Wright; research and development, Dr. J. Ferguson; technical, Dr. R. Beeching.

The manufacturing divisions have been regrouped, and the number of groups reduced from six to five. The group directors will be as follows: Group A (alkali and general chemical divisions), Dr. J. Ferguson; group B (dyestuffs, paints, and pharmaceuticals divisions), Mr. G. K. Hampshire; group C (fibres, heavy organic chemicals, and plastics divisions), Mr. C. Paine; group D (Billingham and Nobel divisions, Wilton works, and Severnside works), Mr. R. A. Banks; group E (metals divisions), Dr. J. Taylor. Mr. L. H. Williams, who was a group director, has become deputy chairman.



Baker Perkins Foundry Machinery at work... *at Mansfield Standard Sand Co. Ltd.*

This Clay Slurry Plant was built at Mansfield by Baker Perkins. Clay is added to standard sand in quantities which vary to suit the foundry customer concerned. The plant includes a Simplex Mixer, a storage tank, a vibratory screen (to remove oversize material) and pumps. An immersion heater prevents winter freezing. This is one of the many examples of machinery for the foundry and allied industries by Baker Perkins—the firm that supplies the complete range.

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HISTORICAL NOTE

Mansfield Standard Sand Company has been supplying Foundries for one and a quarter centuries and is the sole producer of Mansfield Moulding Sand—known throughout these islands and the world over for its 'standard' quality.

The Company is now producing a new range of 'standards' by blending natural sands to give constant strength and a choice of several controlled permeabilities.

Imports and Exports of Iron and Steel in October

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in October this year. Totals for the first ten months of this year and last are also included.

Total Exports of Iron and Steel

Destination.	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Cyprus	97	1,339	1,442
Sierra Leone	1,367	8,543	6,098
Ghana	2,369	22,680	19,014
Nigeria	4,809	64,187	50,468
Union of South Africa	3,942	34,095	54,952
Rhodesia and Nyasaland	2,924	17,724	22,818
Tanganyika	1,546	16,648	12,756
Kenya	1,812	21,413	24,589
Uganda	219	3,513	1,269
Mauritius	58	1,420	4,070
Aden	302	2,708	2,378
Bahrein, Qatar, and Trucial States	1,377	6,557	12,403
Kuwait	327	9,153	5,368
India	12,228	167,192	212,913
Pakistan	3,438	36,354	55,254
Singapore	2,883	18,811	17,611
Malaya	1,248	8,594	15,408
Ceylon	4,120	32,846	43,565
British North Borneo	486	2,269	3,852
Hongkong	5,108	55,360	69,231
Australia	14,547	68,145	149,665
New Zealand	12,588	81,896	102,232
Canada	11,512	175,018	177,191
Jamaica	2,084	18,053	20,054
Trinidad	2,109	34,545	32,847
British Guiana	638	5,473	7,518
Other Commonwealth countries	1,137	29,734	28,141
Eire	5,551	39,883	51,849
Soviet Union	1,147	28,556	24,303
Finland	6,217	30,261	40,426
Sweden	15,008	104,040	145,547
Norway	13,512	77,955	97,673
Denmark	10,540	78,596	82,607
Western Germany	9,565	101,680	116,618
Netherlands	9,248	80,466	100,032
Belgium	2,388	30,948	28,231
France	1,411	5,041	7,099
Switzerland	1,757	7,313	12,049
Portugal	1,304	12,808	13,605
Spain	2,725	23,734	40,299
Italy	3,771	40,048	36,260
Austria	297	3,444	4,304
Yugoslavia	3,263	4,281	32,339
Greece	3,182	9,608	17,052
Turkey	5,956	4,710	17,621
Netherlands Antilles	33	2,955	2,814
Portuguese East Africa	270	1,251	3,806
Egypt	1,949	3,208	11,878
Sudan	830	6,101	8,086
Lebanon	33	3,054	1,700
Israel	1,171	12,312	16,326
Saudi Arabia	6	2,949	375
Iraq	5,272	69,325	37,832
Iran	11,226	32,429	60,102
Burma	160	7,582	4,961
Thailand	466	7,235	5,434
Indonesia	552	5,877	20,502
China	6,191	41,515	45,719
Japan	3,921	144,453	58,363
Philippine Republic	377	6,759	6,427
USA	7,373	159,307	171,355
Cuba	719	6,140	6,624
Colombia	1,283	3,705	7,874
Venezuela	1,645	58,428	30,083
Ecuador	351	848	2,479
Peru	393	2,223	5,321
Chile	323	1,236	3,603
Brazil	490	19,942	23,339
Uruguay	907	1,492	7,585
Argentina	6,991	180,737	72,121
Other foreign countries	10,705	73,733	117,169
TOTAL	255,754	2,482,458	2,752,899

Total Imports of Iron and Steel

From	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Union of South Africa	1,837	22,010	25,641
Rhodesia and Nyasaland	1,483	4,413	6,606
Canada	21,834	15,452	219,708
Other Commonwealth countries and Eire	5,485	9,665	43,411
Soviet Union	—	44,448	27,596
Sweden	5,750	24,953	41,119
Norway	10,242	71,389	129,914
Poland	275	4,162	8,645
Western Germany	5,223	62,882	113,863
Netherlands	14,944	134,626	168,272
Belgium	6,236	19,116	97,900
Luxembourg	1,387	5,536	13,150
France	5,580	18,231	58,090
Italy	258	11,628	21,606
Austria	682	3,476	10,333
Japan	622	2,008	5,939
U.S.A.	11,533	20,739	325,647
Other foreign countries	11,116	9,811	133,271
TOTAL	104,487	484,545	1,450,711
Iron and steel scrap and waste, fit only for the recovery of metal	25,937	2,518	221,171

Exports of Iron and Steel, by Product

Product.	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Pig-iron	7,355	118,456	128,450
Ferro-columbium (niobium)	4	55	89
Ferro-tungsten	54	1,000	797
Other ferro-alloys	1,126	7,202	9,348
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars), and similar primary forms	314	71,573	22,024
Pieces roughly shaped by forging	37	1,342	803
Iron bars, rods, angles, shapes, and sections	118	328	552
Steel bars, rods, angles, sections, and shapes	45,156	405,901	509,256
Iron plates and sheets	1	1,532	528
Universal plates	2,386	7,867	16,993
Steel plate, 3 mm. and under 4·5 mm. thickness	1,744	34,436	32,569
Ditto, 4·5 mm. or more in thickness	30,535	170,799	287,303
Blacksheets and blackplate	26,294	230,953	247,708
Hoop and strip	8,179	69,249	84,600
Tinplate	35,787	388,882	414,431
Decorated tinplate	617	7,278	5,140
Galvanized sheets	6,614	71,939	68,967
Other (incl. tinned sheets, terneplate, and ternesheets)	3,525	18,069	23,354
Railway and tramway construction material	20,847	140,835	144,120
Wire rods of steel (incl. alloy steel)	3,378	41,155	45,665
Wire	10,167	88,855	98,720
Tubes, pipes and fittings	51,516	604,746	611,482
TOTAL	255,754	2,482,458	2,752,899

Mr. L. R. BEESLEY, 48, has been appointed director-general of aircraft production in the Ministry of Aviation.

The sixth EARL OF VERULAM, formerly Mr. John Grimston, has been elected chairman of Enfield Rolling Mills, Limited, following the death of the fifth Earl. Mr. W. R. BRUDENELL FOSTER has been elected vice-chairman.

Gas Cleaning at Dorman Long

Blast-furnace gas cleaning plant for the No. 1 furnace at the Clay Lane ironworks of Dorman, Long (Steel), Limited, is to be built by Lodge-Cottrell, Limited, a member of the Simon Engineering, Limited, group. The contract is worth approximately £300,000. The plant will consist of two scrubber towers and three electrofilter units together with h.t. transformer-rectifier equipment, designed to clean 7,800,000 cu. ft. of gas an hour, n.t.p., operating at 10 lb. per sq. in. and capable of withstanding a pressure of 25 lb. per sq. in.

Lodge-Cottrell will also supply Dorman Long with precipitators for the Lackenby steel plant oxygen-blown furnaces. This plant consists of one four-stage horizontal-flow high-efficiency electrofilter together with all the necessary transformer-rectifier equipment, ventilation fan, drag link conveyors, rotary seal, and dust-collecting and pelletizing plant, and is worth approximately £66,000.

Firth Cleveland forms New Steel Sales Company

New company, Firth Cleveland Steel, with registered offices in Sheffield, has been formed to undertake the sales functions of J. J. Habershon & Sons, Limited, the Tenuous Steel Company, Limited, and Firth Cleveland Steel Strip, Limited, all members of the Firth Cleveland, Limited, group.

Firth Cleveland Steel has been formed so that the individual customers of the three manufacturing companies "shall reap the benefits of the potential of these companies, which are now operating in the closest touch with each other," said the managing director, Mr. J. Tonking.

Board Changes

A. LAWRENCE & COMPANY (MACHINE TOOLS), LIMITED—Mr. L. G. Walter has joined the board.

CUMMINS ENGINE COMPANY, LIMITED—Mr. Rex A. Sebastian has been appointed managing director.

HESTON AIRCRAFT & ASSOCIATED ENGINEERS, LIMITED—Mr. B. R. S. Jones has resigned as joint managing director for health reasons. He will remain on the board as deputy to the chairman.

PRESSED STEEL COMPANY, LIMITED—With the retirement on December 31 of Mr. W. E. Lambourn, his colleague, Mr. F. E. Cairns, becomes sole deputy managing director. Other appointments are:—Mr. R. Craig, senior executive director; Mr. R. N. Davies, group director of manufacturing and a director on the main board; Mr. S. C. E. Lewis, group supplies director and a local director; Mr. L. Long, deputy group director of manufacturing; Mr. S. A. J. Frampton, works manager, Cowley, and a director of the car body division; Mr. A. H. Pether, group tool manager and a director of the car body division.

Because of its continued expansion, BROWN, LENOX & COMPANY, LIMITED, engineers and steelfounders, of Pontypridd, has appointed two new directors:—Mr. E. J. Upward and Mr. W. G. Munday. Before joining Brown Lenox, Mr. Upward was employed by Guest, Keen & Nettlefolds (South Wales), Limited, and at the Cardiff plant of Guest, Keen & Baldwins, Limited. He joined Brown Lenox as cost accountant in 1946, becoming successively assistant commercial manager and commercial manager. Mr. Munday was formerly with the construction staff of the Steel Company of Wales, Limited, during the erection of Trostre and Velindre works.

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Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House, 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

FOUNDRY EXECUTIVE with wide experience in management combined with first class practical knowledge of modern production methods for C.I. and non-ferrous castings. Has ability to organise and control large foundry and make it pay. May be able to introduce new business. Box WW520, FOUNDRY TRADE JOURNAL.

FOUNDRY METALLURGIST (City & Guilds), experienced iron and steel, CO_2 and shell-moulding. Radiographic inspection. Available January. Box FM521, FOUNDRY TRADE JOURNAL.

CHIEF ENGINEER (40), A.M.I.PlantE., A.M.I.B.F., seeks new post. Good experience modern mechanised foundries and machine shops. Installation, maintenance, planning, development, malleable grey iron, steel. Salary £1,500—£2,000. Assistance with housing. Box CE946, FOUNDRY TRADE JOURNAL.

NON-FERROUS FOUNDRY EXECUTIVE. A.M.I.B.F., seeks change, 20 years' experience aluminium gravity die-castings, good knowledge of CO_2 and shell coremaking. Birmingham area. Box NF515. FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

METALLURGIST (young qualified) required for Investment Casting Foundry in Midlands. Experience of steel investment casting essential. Good prospects and salary. Write, giving full details of age, qualifications, previous posts held, etc., to Box MY507, FOUNDRY TRADE JOURNAL.

Applications are invited for a

FOUNDRY SUPERINTENDENT

with a leading North Midlands Engineering Company.
Applicants should have first class technical ability and a practical knowledge of all aspects of High Grade Iron Foundry production including mechanised, semi-mechanised, jobbing work from small to 15 tons in Drysand, Loam and CO_2 Process. Knowledge of Nodular Iron production also necessary.
Initiative and executive ability absolutely essential.
Superannuation scheme available and assistance will be given with housing. Excellent prospects for the right man but only a first class Foundryman with good knowledge of shop management should apply.

BOX AA506, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

METALLURGIST. F.H. (Foundries) Ltd., Pottery Lane, Newcastle Upon Tyne, require energetic young Metallurgist with good all-round foundry experience to join a happy young team of Executives who are successfully rebuilding an old-established Grey Iron Foundry Business. Prospects very good. Write before January 10, stating qualifications, experience and salary required to start.

SALES REPRESENTATIVE. Large engineering concern in the West of Scotland area requires a young energetic sales representative to promote the sale of iron and steel castings in the open market. Applicants should be fully conversant with all aspects of Iron and Steel Founding and have had previous sales experience in this field. Salary will be awarded in accordance with qualifications and experience. Apply Box SR963, FOUNDRY TRADE JOURNAL.

Advertisers whose announcements appear under a box number are urged to acknowledge, however briefly and informally, all replies received. This particularly applies to advertisements under "Situations Vacant"; serious inconvenience and, sometimes, real hardship can be caused to applicants who receive no indication even of the safe receipt of their communication. Failure to acknowledge replies can also reflect on the good faith of this journal, which is responsible for their onward transmission. If it is desired to maintain anonymity, an acknowledgement on plain paper, quoting the relevant box number, is all that is necessary.

SITUATIONS VACANT—*contd.*

PATTERNMAKERS (wood and metal) required. Excellent wages and plenty of overtime. Permanent positions. STANDARD PATTERN CO. LTD., 25A Broadwall, Stamford St., S.E.1. WAT 6875.

AUSTRALIAN opportunity. TECHNICAL SALES ENGINEER required by leading manufacturers of foundry equipment after initial training period England to work permanently in Australia resident Adelaide area. Progressive position for ambitious man with plant sales and administrative experience. Write fullest details experience, salary, etc., to Box No. 996, DORLAND (CITY), LIMITED, 28, Haymarket, London, S.W.1.

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Experience of Sand Control essential. Opportunity to develop Sands section of the Laboratory.
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Previous experience of similar nature would be welcomed, but applicants who feel they possess such initiative and qualifications, but for whom such a post has not been made available, will be considered most seriously.

Initial salary will be considerable, but will depend on the experience and capabilities of the person to whom the appointment is offered.

Please reply, stating previous experience and salary desired to :

BOX IE519, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

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SERVICE ENGINEER required by well known Foundry Equipment Manufacturers. Preference given to applicants residing in the South West Midlands or Birmingham-Coventry area. Non-contributory pension scheme. Write stating age and full details of past experience to Box RB986, FOUNDRY TRADE JOURNAL.

REORGANISATION of Foundry Sand Quarry. Imaginative and vigorous personality to reorganise and improve quarry plant and production. Object to improve product and increase sales and to gradually increase and introduce other lines. Must, to begin with, be willing to participate physically in such quarry production until organised to his satisfaction. Actual mechanical handling experience and knowledge of foundry practice desirable. Present production about 55,000 tons per annum. May interest Foundry Manager, Transport Manager, etc., or University Graduate. Able to take sole charge after about six months. Near Birmingham. Box RO977, FOUNDRY TRADE JOURNAL.

OPPORTUNITY FOR FOUNDRY ENGINEER with a firm of Foundry Consultants. Experience is required in foundry problems in the production of cast iron together with a sound knowledge of melting practice and the metallurgy of cast iron. The applicant will be required to travel in England and the Continent. This position offers a wide scope of interest for an individual, age 25-35 years, with an aggressive approach to problems. Please reply to THE INTERNATIONAL MEHANITE METAL CO. LTD., 4 Downside, Epsom, Surrey.

SITUATIONS VACANT—*contd.*

METAL PATTERNMAKER required by Malleable Foundry in South Africa. Must be good all-round man with working knowledge of Malleable Foundry practice. Good salary and contract offered to right man. British personnel already on our staff. Box MP951, FOUNDRY TRADE JOURNAL.

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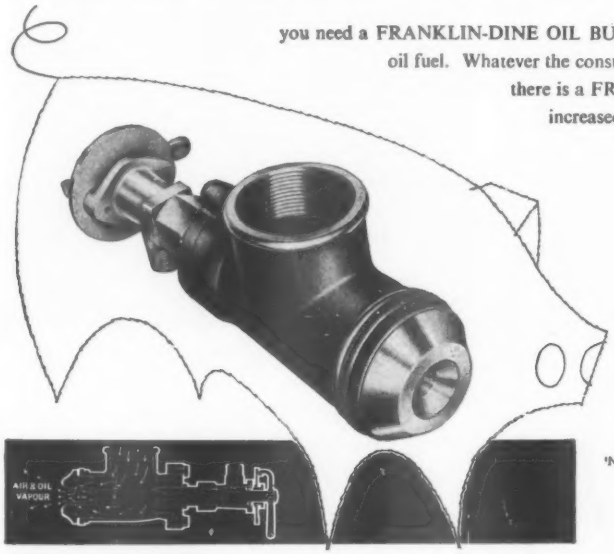

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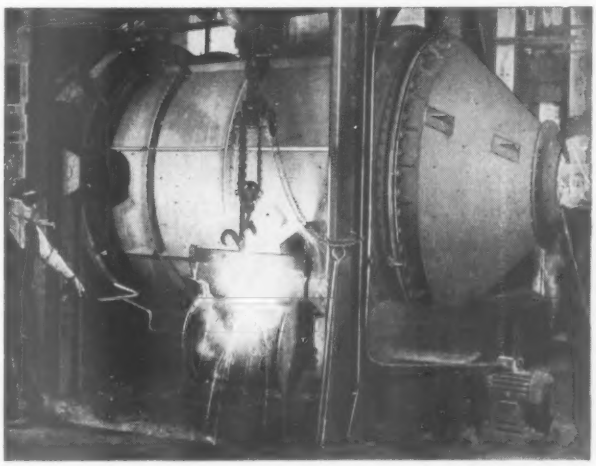

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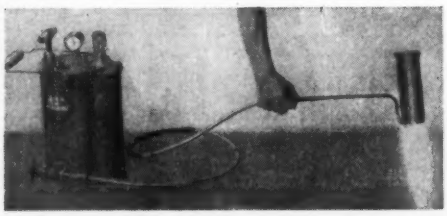

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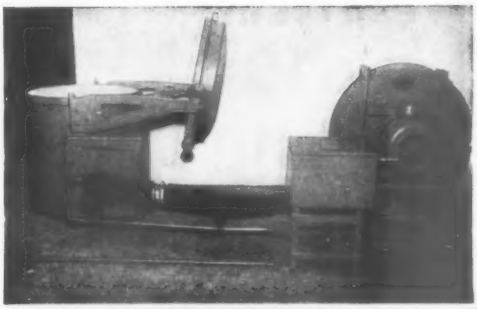

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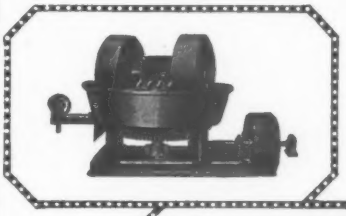

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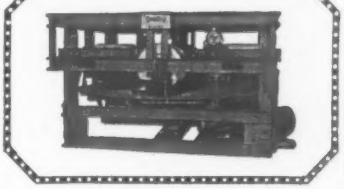

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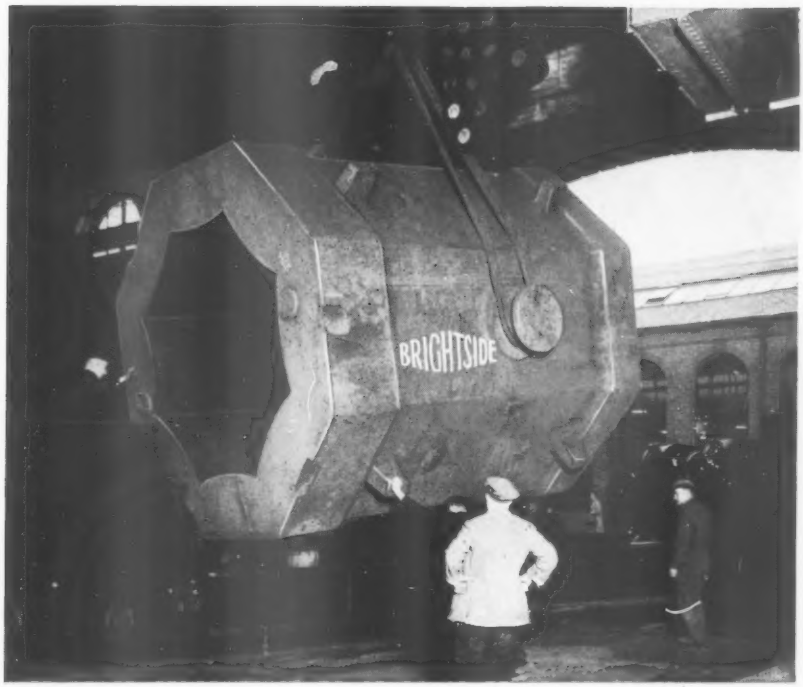

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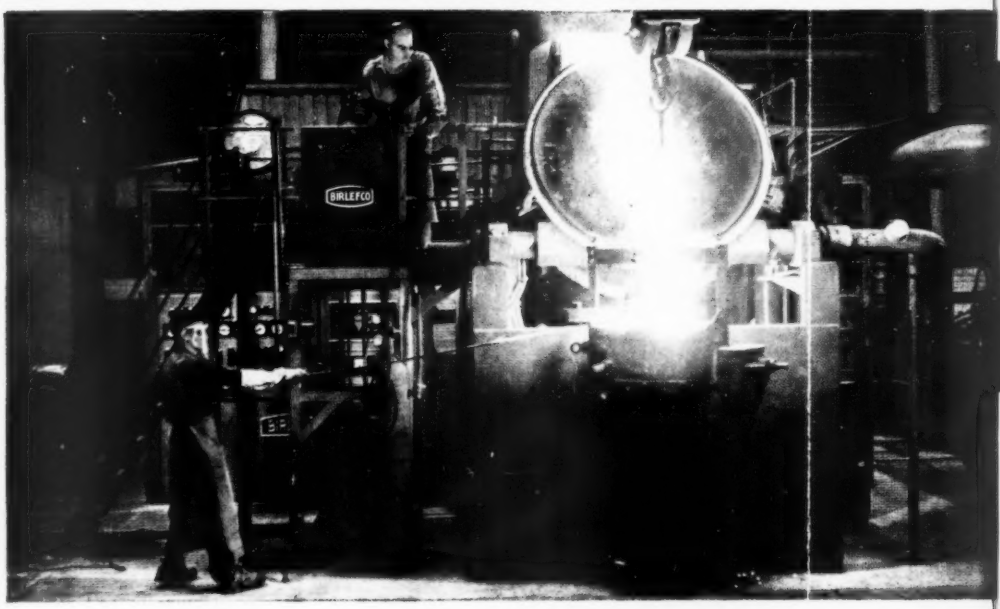

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